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EDSON'S RECORDING STEAM GAUGE.

So long as human nature is as unreliable as it is at present, there will always be danger that a steam boiler when entrusted to the care of an engineer, may at times be subject to a dangerous pressure. This is much more liable to occur with locomotive engines, which are nearly always in use miles away from the observation of those in authority, than with stationary or marine boilers, which at any time are subject to the inspection of the owner, or "boss," whoever he may be. The invention which we give an illustration herewith is designed to keep a constant record of the steam pressure in boilers to which it is attached. It does this by means of a pencil, which is attached to the indicator of the gauge. This pencil marks on a slip of paper the rise and fall of the pressure. As it increases the pencil makes a straight vertical line, and as it falls the drum on the right is revolved by suitable gear and a ratchet on the top. The drum moves the paper and causes the pencil to make an oblique line as shown in cut. Vertical lines therefore indicate an increase in the pressure, and oblique lines a decrease. So long as the steam pressure does not vary, neither the pencil nor the paper are moved. Every variation is therefore recorded. There is also an alarm attached, which commences ringing as soon as the pressure reaches any point determined upon. We copy the following excellent description of the construction of the instrument from the *Scientific American*:

"The steam enters by an ordinary pipe coupling into a series of circular, horizontal chambers, placed behind the pencil bearing, and by expanding, the former is made to operate the gear, causing the pencil to move upward in proportion to the degree of steam pressure, and ringing the alarm when the previously fixed limit is reached. The reverse movement of the gear, produced during the reduction of pressure, moves the pencil downwards, simultaneously with the rotary motion (given by means of a horizontal rack and lever operating a pawl within the upper rim) of the receiving drum, and, in consequence of the motion thus given to the chart, the pencil is made to trace an oblique line, invariably in proportion to the fluctuation or reduction of pressure. A vertical line always denotes degrees of increasing pressure.

"The chambers consist of pairs of corrugated steel disks, each disk, as well as the other motive parts, being nickel-plated, to prevent them from corrosion, even in a saline atmosphere.

"The vertical scale is placed at the left of the pencil, as a guide for the chart; also for greater convenience when marking the pressure upon the chart, previous to its removal. The charts are divided into sections, numbered consecutively "50," "51," etc., the sections being sub-divided into four parts, marked 1, 2, 3, 4.

"The instrument is secured with a combination lock, and may be placed in the cabin of a steamer, or office of the commander, as well as in an engineer's or superintendent's room, when required. It is adapted to locomotive, stationary, and marine boilers, of high or low pressure, as gas receivers, stills, soda fountains, etc.

"It was patented in the United States, May 5, 1868, Aug. 3, 1869, and Aug. 16, 1870; also in several foreign countries. Manufactured and sold solely by 'The Recording Steam Gauge Company of New York,' No. 91 Liberty Street, New York."

A TOOL-HOLDER.

Mr. Thomas Wilson describes, as follows, in the *English Mechanic*, a tool-holder of his invention:

I enclose a drawing of a tool-holder intended to supersede the ordinary forged steel tools for self-acting lathes and planing machines.

Fig. 1 is a side view of the holder and tool complete. Figs. 2 and 3 respectively a front view and plan of the

found to answer admirably. As will be seen from Fig. 3, it will work out a square corner and clear itself, will cut in either direction, and is applicable either to light or heavy work.

Toronto and the Great Western Railway.

The following is from the annual review of the commerce of Toronto published in the *Toronto Globe* of the 3d inst:

We have already referred to the alteration of the gauge of the Toronto Branch of the Great Western Railway, a work which was done with surprising rapidity—traffic being stopped only a portion of a day. The authorities of the Great Western no doubt believe it to be to their advantage to make the width of the gauge identical with that of their main line from Hamilton to the bridge, or the expense of the alteration in track, equipment of cars and purchase of new engines, &c., would not have been incurred. It is the intention of the company to make the whole of their system correspond with the American gauge, and the work on the Toronto Branch was but a step in the carrying out of this policy.

The change cannot fail to be of benefit to the merchants of Toronto, and Toronto people generally. It practically places the city a day or two nearer the American markets and the principal Eastern seaports.

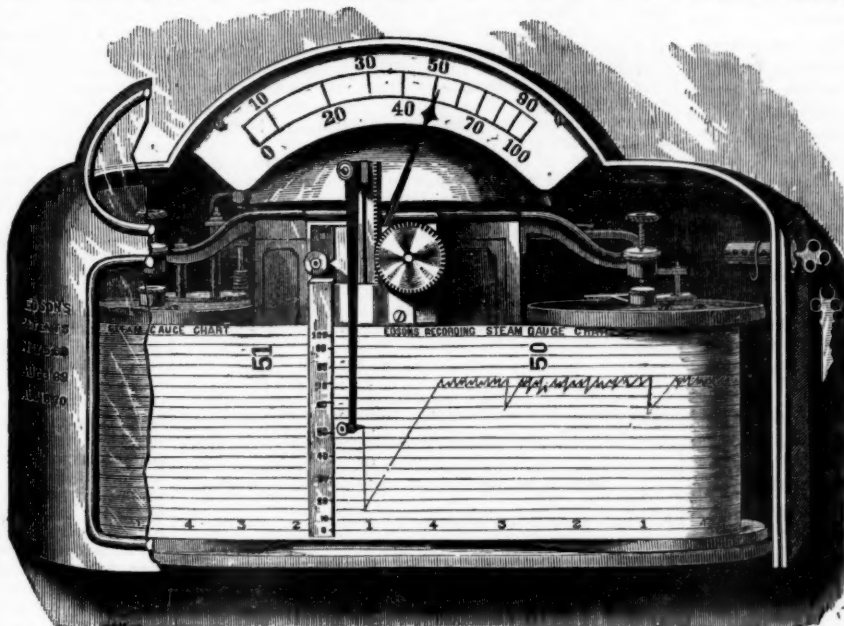
Grain in car loads, under the seal of the United States Customs at the shipping point, can now go through to the end of its journey in the East without break of bulk; and, of course, making better time because not subject to the delays incident to transshipment.

Two years ago there was a great block of freight at the Suspension Bridge, chiefly grain in bulk. The Great Western had ample means to move it to the bridge, but the New York Central had not sufficient cars to take it forward. Delays of this nature were attended with great inconvenience and loss to all concerned. Now, however, when a car is loaded it is pushed through with all dispatch, and blocks of freight do not occur.

There is also a great advantage in a shipper being able to foresee within a few hours the time of arrival of his consignments in the eastern market; and it is likely that the facilities for shipping through without the labor of changing freight from one car to another, with other expenses also saved, will ultimately result in a diminution of rates on goods generally. The advantage of non-transshipment will be very great as regards groceries, teas, fruits, etc., from the East, which more than any other class of goods suffer in the handling.

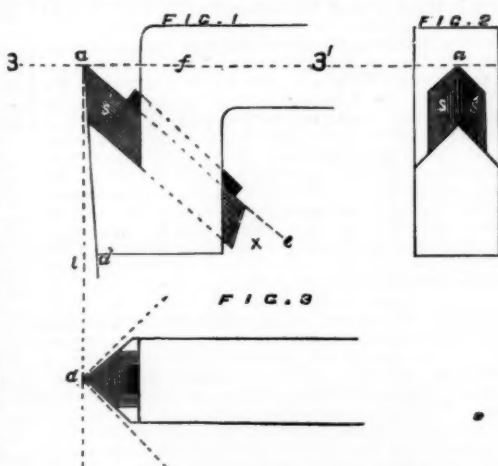
We have collected a few figures illustrating the passenger and freight business to and from Toronto, via the Great Western Railway, for the year now ended.

We find that no less than 200,000 bushels of grain have left our city by this route in the period named; 17,000 tons of miscellaneous freight, several thousand barrels of pork and beef, salt, coal oil, etc., and over 10,000 head of live stock. The receipts for freight, out and in, were over \$210,000; for live stock, out and in, \$14,000; and for passengers, out and in, \$235,000; in all, approximating \$500,000 for the earnings at Toronto for the year. To give increased facilities for so large a business was of course important, and the executive of the company have displayed great vigor in affording them. The Toronto line has always been supplied with the best of the company's equipment. We had



EDSON'S RECORDING STEAM GAUGE.

same. The holder *per se* is made of 1 in. square cast steel. The tool, *z*, is a flat piece of cast steel $\frac{1}{2}$ in. \times $\frac{1}{2}$ in., and is shaded in the drawing. The wedge for fixing the same on the slot in the holder is marked black in the drawing. These three parts constitute the entire



WILSON'S TOOL-HOLDER.

apparatus. The two facets, *s s'*, forming the end of the cutter meet at an angle of 90°. The angle *i a d* is 40° 12'; *e a d*, 45°; *e a f*, 40° 48'. It follows according to trigonometrical principles that the cutting edges of the tool will be 60°, and the facets, *s s'*, will allow 3° clearance; both of which conditions, I believe, are theoretical, as they certainly are practically, correct.

The cutting point, *a*, should on no account be placed above the centre line *33'*; for should the tool be overloaded it will then bend from the work, whilst if placed above that line it would dig into the work, and something must "go"—the strap will slip, the center give way, or the tool break.

The above tool-holder, if used in connection with some contrivance for horizontal adjustment, will be

the pleasure of referring, a short time ago, to the probability of palatial drawing-room cars being provided, which would be run between Toronto and Buffalo without change or detention either at Hamilton or at Suspension Bridge. We have since been informed that these arrangements are nearly completed, and the public may look for the arrival of these luxuries of travel at an early day.

The project of erecting a commodious Union Depot for the accommodation of all the railways leaving Toronto is being seriously considered and at present bids fair to be carried out. We hope it may be, and if it can also be made a Union Steamboat Landing and Railroad Depot, so much the better, as it would benefit the city in many ways and be a valuable boon to travelers. A Union Depot should have been erected by the Corporation, or some joint stock company, years ago. It would not be a bad investment for a joint stock company, for undoubtedly the various railroad and steamboat lines would be willing to pay handsome rentals.

Report of the Massachusetts Railroad Commissioners.

This very elaborate report is one of the most interesting investigations into the relations of railroads to the community that has ever appeared. The first part containing 32 pages, with appendices covering 70 pages more, is devoted to matters peculiar to Massachusetts "being rather a local or temporary description." The second part embraces what the Commissioners call "The general questions of railroad development, which are now subjects of inquiry here, no less than elsewhere, and which arise out of the relations existing between the community and its railroad corporations."

The second part of course, is that which is chiefly interesting outside of Massachusetts at least. This is introduced by a declaration that a very complete knowledge of the subject is necessary to any intelligent discussion of it, and that especially to the information of any just and effective system of legislation. Their eighteen months' study of the subject, say the Commissioners, "hastened to impress them with a consciousness rather of the difficulties which surround it, than with a confidence in their own abilities to deal with them."

A short space is given to the discussion the "through business," which is reported to have been in a quite satisfactory condition. The lines on which this business is done being for the most part outside of the State, it can be affected very little, if at all, by Massachusetts legislation. Tabular statements given show that shipments are made more and more by the all-rail routes and less by the rail and water routes.

The report recommends that the policy of Massachusetts with regard to these through routes be one of great caution. We copy from the report concerning the internal system of the State, the following:

If the through or external railroad relations of the Commonwealth are in a condition even more satisfactory than they were a year ago, the commissioners greatly regret to say that the same cannot be said of the internal system. A similar criticism was made in their first annual report (p. 42). It was then intimated that a reform was necessary in the whole method of internal transportation; the tariffs of different roads were compared, and gross and inexplicable variations in them found to exist; the system of delivery was pronounced defective; and finally the corporations were called upon to themselves undertake the work of renovation, thus making unnecessary any attempt at governmental interference. At the close of another year, however, the commissioners are not aware of a single step taken or even in contemplation towards the end indicated by them. It is, of course, impossible to regard such a result as in any way satisfactory, and it only remains for this board to sit down under a confessed inability to accomplish anything, or to have recourse to more definite language, and to suggest a more decisive line of action. Under these circumstances, and pursuing their investigations under the resolve of the last legislature, the commissioners feel no disposition to shirk any responsibility or to avoid the issue presented.

The commissioners base their investigations and all their economical conclusions on this principle: All sums exacted from the community for transportation, whether of persons or of property, constitute an exaction in the nature of a tax—just as much a tax as water rates, or the assessments on property, or the tariff duties on imports. That it is wholly, or in part, a necessary tax—one which can at most only be reduced to a certain point, but never abolished—this, in no degree, affects the principle. It is still a tax, adding in itself nothing to the intrinsic character of property, nor affecting the condition of persons, but simply moving the one or the other from point to point. The reduction of this tax to the lowest possible amount paid for the greatest possible service rendered, always observing of course the precepts of good faith and the conditions of a sound railroad system—this must be the great object the commissioners retain always in view. Much is constantly heard of the importance of railroad charges as an element in the calculation of the

Western agriculturist. Under this incessant discussion, and a spirited competition of trunk lines, the cost of transportation of Western produce to the seaboard has now been reduced to a point hitherto regarded as chimerical. During the last summer three mills per ton per mile has been a rate not unknown. The commissioners have no criticism to make upon this.

Any arrangement which enables the farmers of the West to successfully compete with the producers of the Danube and Black Sea is a subject of national rejoicing. The commissioners desire none the less to express grave doubts whether the transportation tax weighs as heavily after all upon a farming and agricultural region as it does upon a manufacturing district as peculiarly located as Massachusetts. It here appears in every possible shape—it is encountered at every step. It may safely be asserted that there is no branch of Massachusetts industry which is not carried on against competitors more advantageously located. The State has very few natural advantages; but everything with her depends on the intelligence of the people and the cost of transportation. The West in producing cereals has at least a soil of unsurpassed fertility; Pennsylvania in manufacturing iron has the ore and the coal in close proximity to the furnace; the English mill-owner has his power and his labor in cheap profusion. Almost every article, however, which enters into the industries of Massachusetts has to be brought within her limits from a distance. Her very water-powers are subject to inclement winters and dry summers, while she has to make her ingenuity supply a deficiency in labor. Her food is, then, brought from the Northwest; her wool and her leather from South America, Texas, California and the Central States; her cotton from the South; her ores from the Adirondacks; her coal from Pennsylvania; her copper from Superior, and the list would admit of indefinite extension. Massachusetts is thus merely an artificial point of meeting for all kinds and descriptions of raw material, which is here worked up and then sent abroad again to find a consumer. At every point, coming and going and in process of manufacture, it has to be transported, and it has to bear all costs of transportation in competition with articles of the same description produced elsewhere and by others. Every reduction of the transportation tax acts, then, as a direct encouragement to the industry of Massachusetts just as much so as if it were a bounty or bonus—it is just so much weight taken off in the race of competition.

TABLE No. 3.

Gross and Net Income of Railroads in Massachusetts from 1861 to 1870, inclusive, and estimated Income for Roads within the limits of Massachusetts, with the Amount of Taxes for State, County and Town purposes.

	Gross Income.	Net Income.	Estimated Income of Roads within Mass.	Total State, County and Town Taxes.
1861.....	\$8,016,149 12	\$2,916,411 80	\$7,032,596 34	\$7,600,501 00
1862.....	9,992,581 31	3,581,657 61	7,748,193 49	8,605,511 19
1863.....	11,950,739 28	4,424,157 43	9,321,576 70	10,599,097 22
1864.....	16,478,596 16	4,790,256 86	12,853,305 04	12,876,850 59
1865.....	18,974,914 66	4,942,661 98	14,900,433 58	15,990,830 79
1866.....	21,305,527 97	5,383,743 65	16,540,312 03	18,694,039 07
1867.....	21,561,040 96	5,492,565 64	16,817,627 76	19,104,074 79
1868.....	22,761,646 71	5,845,596 94	17,764,084 59	18,056,193 00
1869.....	24,590,723 90	5,926,613 98	19,140,983 16	20,607,963 00
1870.....	\$25,003,953 20	\$6,392,547 20	\$19,503,083 20	\$21,922,569 00
Totals in ten yrs.....	\$141,512,195 89	\$141,666,529 65
Gross amount of both taxes in ten years.....	\$268,178,725 54			
Excess of municipal over transportation tax.....	154,333 76			

*Ten months reported and two months estimated.

Such is the nature of the transportation tax; it next remains to inquire as to its amount. The above table (No. 3) shows the returns of the Massachusetts railroad system, as respects gross earnings during the last ten years. They are not entirely accurate for the purposes in view, inasmuch as many of the roads included, such, for instance, as the Boston & Maine, the Eastern, the Cheshire, and the Hartford & New Haven, return all their receipts, though but a small portion of their respective roads are within the State. A deduction of 22 per cent. is therefore made from the aggregate gross receipts of each year, as an allowance for this variation. Here then is a tax rising from \$7,032,596.34 in 1861, to \$19,503,083.20 in 1870, levied by the railroad corporations for services rendered the community in the way of transportation. An additional column in the table represents the entire State, town and county taxes levied during the same years. These figures should have a very grave importance to the people of Massachusetts, estimated at \$700,000,000 annually, pays on account of municipal taxation and transportation alone over \$40,000,000 per annum. While, for reasons heretofore stated, it will not do to press this analogy between the two taxes very far, yet these being two of the principal burdens under which production everywhere labors, it is very important to see how industry in Massachusetts is situated in regard to them, as compared with industry in other localities—are its burdens here heavier or lighter than elsewhere? As regards the transportation tax, it is almost impossible to derive any results of value from a comparison of statistics. This tax has one peculiarity in common with the tariff duties on imports—the lower it is fixed, within certain limits, the larger in its aggregate it becomes. A large *per capita*, therefore, by no means indicates an oppressive scale of charges, but rather the contrary. Industry pays a large tax because the tax is fixed at a point which enables industry to pay it. For instance, the average contribution of each human being in the United States to the earnings of the railroad system is estimated by the best authority at about \$10 per annum.* Manufacturing communities always make much more use of their railroads than any other. Yet while the *per capita* in Massachusetts

* Manual of Railroads of the United States, 1870. H. V. Poor. p. xxxvi.

rises only to \$13.81 per annum, that in Pennsylvania rises to over \$20. This apparently is largely due to the fact that a single corporation in Pennsylvania, moving alone five-sixths as large tonnage as all the roads in Massachusetts combined, and returning nearly as large an income,* makes this great movement at a charge per ton per mile of a little less than one-third of the usual charge on local movement in this State. The charges on the road referred to and on eight Massachusetts roads are set forth in the accompanying table.

TABLE No. 4.

	Average Rate per Ton per Mile in cents on Freight moved in 1869.	Local Freight.	Through Freight.
Boston, Clinton & Fitchburg.....	6.15	5.21	
Boston & Lowell.....	7.15	2.98	
Boston & Maine.....	5.04	3.43	
Boston & Providence.....	3.42	5.54	
Cape Cod.....	3.53	4.85	
Cheshire.....	7.32	2.86	
Eastern.....	6.35	2.56	
Fitchburg.....	7.46	2.73	
Norwich & Worcester.....	4.40	4.00	
Pennsylvania.....	1.72	1.72	

The Boston & Albany road should be included in the table, but unfortunately this company does not discriminate in its returns between earnings from through and local freights. Its average charge per ton per mile on its entire freight movement in 1869, was 2.43, or 41 per cent. above that on the Pennsylvania road. No reliable conclusions, however, can safely be drawn from such a comparison; that here drawn by the commissioners is probably correct, but, while one State has a thorough produce or transit business, or a coal traffic, or a large manufacturing population, which another has not, it is impossible to argue certainly from the one to the other.

The case stated, however, fully serves to illustrate the distinction between the municipal and the transportation tax which the commissioners desire to point out. The larger the aggregate of the municipal tax, the heavier the burden imposed by it on the production of the State; while, on the contrary, the higher the total of the transportation tax rises the greater is the volume of business and the lower are the tariff rates probably indicated. The municipal *per capita* and the transportation *per capita* in Massachusetts are each about \$13.80 per annum; the first is 30 per cent. higher than the *per capita* to New York and 64 per cent. higher than that of Ohio, while, as regards cities, the *per capita* tax of Boston is 35 per cent. higher than that of New York, while that of Philadelphia is but 40 per cent. of that of Boston.

A sufficient reference has already been made to the *per capita* transportation tax in this State; so far as any deductions can safely be drawn in regard to it, it would seem to be nearer the average of the whole country than should be the case in so busy and thriving a community. In any event it is safe to say that, taking the two together, a very heavy and oppressive burden is imposed on the annual production of the State. To reduce it is simply to give the Massachusetts manufacturer an equal chance with others in the common market. Meanwhile, so far as the ultimate effect is concerned, in the impetus given to production, a reduction in the municipal tax or a reduction in the transportation rates operate in exactly the same way. A reduction on an average of 20 per cent. in existing railroad tariffs throughout Massachusetts would probably, though it might decrease net earnings, double gross earnings, which are the aggregate tax, and have much the same effect on the prosperity of the Commonwealth as doing away with the whole State tax.

With the municipal tax this board has no concern.† The figures concerning it are adduced here simply for purposes of illustration. The discussion of railway charges is of at least as much consequence industrially to a people as the whole ordinary question of taxation; but, in discussing it, the object the community should ever keep in view is, not to reduce the gross amount it pays, but so to regulate and dispose of the burden as to enable it continually to pay more. The commissioners desire, therefore, to remove in the outset any false, though perhaps popular impressions which may exist in regard to what they have here designated as the transportation tax. They are very far from implying or believing that it has been exacted for insufficient services rendered, or that it ought to be or ever can be abolished. On the contrary, it is a payment which has been cheerfully made in compensation for services of inestimable value. Unless, however, both the nature and the magnitude of the burden are clearly understood, it will be impossible to appreciate the prodigious relief and impetus which any sensible reduction of rates must afford to Massachusetts.

Before entering into the discussion as to what, if any, reduction is possible and how it could best be effected, it would be well to examine into what has already done by the railroads looking in this direction. In order to do this the commissioners have gone back over a period of ten years. The subjoined table (No. 5) shows the rates, according to their own sworn returns, at which several railroad corporations have transported passengers and tons of freight during each of the years

* The following are the exact figures in the two cases referred to:—

	1869.	Tons carried.	Gross Earnings.
Pennsylvania Railroad.....	5,422,961		\$17,250,812 00
Massachusetts Railroads, (total.).....	7,378,083		\$1,539,723 00

Deducting from the totals of the Massachusetts system 22 per cent., as representing the amount properly to be credited to portions of the roads lying in other States, the entire railroad system of Massachusetts proper will be found to return a tonnage movement of 351,944 tons, and a gross earnings of \$1,890,173 more than the Pennsylvania Railroad.

† In preparing this portion of their report the commissioners were most kindly and liberally furnished with statistics on the subject of taxation in this country and elsewhere, by the Hon. D. A. Wells, head of the commission on revision of the revenue laws of New York. As these figures will appear in the forthcoming report of the New York commission, it has not been judged necessary to use them here. They reveal, however, the startling facts, that, while on a *per capita* of taxation, Massachusetts is probably the most heavily taxed State in the Union, Boston is unquestionably the most heavily taxed city in the world.

Sam. Craighead, Dayton, Ohio; D. M. Stanton, New York, President Alabama & Chattanooga Railroad; A. H. Whiting, (residence unknown); G. L. Johnson, Arkansas; J. W. Goodland, Arkansas; Powell Clayton, Governor of Arkansas; Sam. Tate, Memphis, late President Memphis & Charleston Railroad; W. Bolton, Mississippi; George Malley, President Tennessee & Pacific Railroad, Nashville; O. H. Bynum, Alabama; M. Burns, President First National Bank, Nashville; J. C. Goodloe, Alabama; E. G. Barney, railroad builder, New York; Cyrus Bussey, merchant, New Orleans; J. W. Forney, editor, Philadelphia; J. Lockwood, Louisiana; E. M. Davis, Paducah, Ky.; N. Patten, Texas, friend of Senator Flanigan; W. Flanigan, Texas, son of Senator Flanigan; G. O'Brien, Texas; G. P. Buell, ex-confederate general, Engineer Texas Railroad; G. H. Gidding, Trans-continental Railroad; J. J. Newell, Trans-continental Railroad; E. W. Rice, Washington, D. C.; R. M. Shoemaker, railroad contractor, Glendale, Ohio; Samuel Sloan, New York; S. W. Morton, Louisville, Ky.; J. P. Bowen, Louisville, Ky.; L. M. Flourney, Pontotoc, Miss.; J. J. Hinds, steamboat owner, Decatur, Ala.; G. R. Weeks, Ky.; J. T. Ludling, Chief Justice of Louisiana; B. C. Gilbert, Florida, brother of Senator Gilbert; B. D. Williams, Superintendent Memphis & Little Rock Railroad, Memphis; Thomas Alcott, Trans-continental Railroad; G. A. Fosdick, Louisiana; Harry Hays, New Orleans; P. S. Forbes, Boston; John S. Sprague, Minnesota, railroad engineer; L. R. Marsh, New York; A. W. Beckwith, Chicago; J. C. Stanton, Chattanooga Railroad; Cyrus H. Baldwin, South Carolina; A. J. Hamilton, ex-Governor of Texas; Rush R. Sloan, Sandusky, Ohio; Silas C. Colgrove, Indiana; Samuel D. Jones, Opelika, Ala.; N. H. Decker, New York; B. F. Allen, banker, Des Moines, Iowa; J. B. Chaves, Delegate from New Mexico; Augustus Kountze, banker, Omaha; John N. Goodwin, ex-Governor of Arizona; General W. S. Rosecranz, San Francisco; Michael Hahn, ex-Governor of Louisiana; J. S. Williams, Louisiana; G. M. Spencer, Mississippi; L. J. Higbee, New Orleans; W. C. Kimball, San Diego, Cal.—*N. Y. Herald, Jan. 13.*

Complexity of English Railroad Traffic.

The following is part of a letter written to the London Times over the signature, "A Railway Official":

Between London Dublin the advertised time of the Irish mails, via Holyhead, by rail and by sea, is eleven hours; while the time taken by the limited Scotch mails by the west coast route between London and Edinburgh and Glasgow, is about ten and a half hours.

The average rate of speed of all these trains exceeds forty miles an hour, including stoppages; the number of carriages is seldom less than twelve, representing when in motion an enormous momentum and weight to be controlled and regulated under all the varying circumstances of the weather, fog and storm, and by night and by day.

The average speed of the railways in this country exceeds that of any other country in the world; the regularity, safety, and liberty of the traveler, and his personal comfort and convenience, exceeds that of continental railways.

It may be asked, why all this hurry and increase of speed during the last twenty years?—for it is well known that an increase of speed means heavier engines, stronger and more perfect carriages, improved and more costly permanent way, better means of signalling, endless sidings to shunt the slow trains out of the way of the fast ones, and last, though not least, a more efficient and well-organized staff of employees. It may be attributed in some respects to the competition that has arisen between all the great companies, encouraged as it has been by Parliament granting competing lines between all the most important places in the country. But that is not all; the public has demanded that the postal service between London and Ireland and Scotland shall be accomplished within a given time, so as to enable the commercial relations of those great centers to be carried on, and it is performed with remarkable exactitude from night to morning between places that are 400 miles asunder, and which, under the old mode of conveyance, forty years ago, it took days to accomplish.

It cannot be too clearly understood that if it were possible to reduce the speed of the fast express and mail trains to thirty-five miles instead of forty miles an hour, the saving to the railway companies would be very great, in some cases equal to $\frac{1}{2}$ per cent. on their dividends, and that the safety of the public would be enhanced.

Hitherto I have referred only to the subject of express and mail trains, but it must be borne in mind that the local traffic of the lines must be provided for, and this is done by stopping, or third-class trains, running an average of twenty miles an hour, and by second-class fast trains running about thirty miles an hour. All these trains of different speed run to accomplish certain objects as regards the public convenience; they have to be arranged and worked, not only so as to avoid interference with each other, but to keep free of the enormous number of goods and mineral trains which have to be run during the twenty-four hours.

Before leaving this part of the subject, I think it must have struck even casual observers that the companies in certain districts away from the metropolis, appear to run far too many passenger trains; many could be dispensed with which are at this moment not earning the mere cost of locomotive power. Yet, the result is, that the passenger train mileage of the country is always increasing, and the cost of conveyance, so far as the public are concerned, is 30 per cent. less than it was twenty years ago.

The goods and merchandise traffic conducted by the railways is, in extent, simply marvellous; the speed at which it is conveyed is not less than twenty-five miles an hour, and it is not generally known, although people

are sometimes astonished at the work accomplished by the post-office, that the large and important shipping traffic between Manchester and London is collected almost as late, and delivered as early, as the post letters; in fact, a merchant, when he arrives at his office early in the morning, finds the invoice sent by post, on his desk, and the goods sent by train, at his warehouse door. It is the same with regard to Liverpool, Bradford, Leeds, and Birmingham, and so exacting has the mercantile public become in this respect, that an hour's delay leads to endless claims for compensation for loss of sale and loss of market, which, if not at once settled, result in the transfer of business to other and formidable rivals, who, for a time, are probably more fortunate.

This illustrates the system of express goods trains carried on not only to the manufacturing districts of Lancashire and Yorkshire, but all over the kingdom to Scotland and Ireland.

Then follow the slow or stopping trains, to give the necessary local service at less important places, followed by heavy coal trains from the great coalfields concentrating upon every large center of population.

These are briefly the elements of railway management, the fast and the slow, the heavy and the light, all to be accomplished and worked on two lines of railway, to be regulated not only with the best and most complete mechanical contrivances, but entrusted to be carried out by, on the whole, no doubt, a competent, intelligent, and an able staff; but there is such a thing as recruiting on railways. A thoroughly able stationmaster, engine-driver, guard, pointsman, or porter takes years to make, and at some point, notwithstanding the utmost care and vigilance, a young or inexperienced man is placed in charge, which not unfrequently leads to serious consequences.

Railway companies may be credited with maintaining a good permanent way, efficient and powerful engines and rolling stock, and that they are doing the utmost to maintain an able and properly qualified staff of servants; but, arising no doubt from a mistaken policy, the companies, instead of providing the requisite wagons for coal, lime, salt, and minerals, have encouraged private firms to provide their own for this description of traffic; and it is a well-known fact that they are not maintained with proper efficiency; that this class of wagon is allowed to run much below the standard of safety, and if there is a serious breakdown it more than probably arises from the failure of private wagons. This point deserves the most serious consideration.

The things which the railway companies appear to have neglected, and obstinately so, are first, the block telegraph; secondly, continuous breaks, and relief, or four lines, in the most crowded districts.

It was unfortunate to hear the evidence of some who are at the head of the principal railways in the kingdom on these questions, before the Special Committee on Accidents and Railway Compensation, appointed by the House of Commons last year; in fact, all experience was on one side, and the evidence of the railway managers on the other; but the public may rest assured that the force of practical opinion will carry these points; and when our lines are thus equipped, it will not be too much to say that our railway service will then earn a character for speed, regularity, and safety such as it never attained before.

Some of the Causes of the Embarrassments of the Union Pacific.

We give below an explanation of certain operations of the Union Pacific Railroad, which appears editorially in the New York Bulletin, a well-informed financial paper:

The present difficulties among the Directors of the Union Pacific Railroad are so intimately connected with the history of the authorities of the road that, in order to explain them, it becomes necessary to make public certain facts which the directors or road builders—for they are the same parties—would no doubt prefer to have kept secret. The total cost charged to the road is \$106,245,000. Toward this amount the United States Government contributed \$26,915,000; next, the Company sold by subscription about \$17,000,000 of First-Mortgage bonds, at prices ranging from 90 to par; realizing from these joint sources about \$44,500,000, less discounts and the costs of marketing the loans. After this, came the resort to "pooling" for carrying on the construction. In the first operation of this character, the directors took from the company \$10,000,000 of First-Mortgage bonds and \$10,000,000 of Land Grant bonds, the former at 85 and the latter at 55. In a second pool, the directors took \$10,000,000 of Income bonds, receiving therewith an amount of stock stated by some to be equal to the amount of bonds, and by others said to have been double the amount—we think it almost certain that the latter version is the true one—the price for these bonds with stock attached being 80. In this way the company disposed of \$30,000,000 of bonds and \$10,000,000 or \$20,000,000 of stock, receiving therefor from the directors \$22,000,000. The bonds thus taken were marketed as rapidly as possible, and at prices which, from the market quotations, show a large average profit.

It thus appears that for \$84,000,000 or more, probably \$94,000,000, of securities issued by the road, the company only received \$66,000,000; and this was paid out for construction done at notoriously high prices. What became of the balance of \$13,000,000 or \$23,000,000 of stock we are not informed; nor does it in any way appear that any adequate value was rendered for it to the road. It will thus be seen that the road has been built with the most wasteful extravagance, first, through marketing a large amount of its securities at ruinously low prices, and, next, through exorbitant charges for construction.

A road thus built, and with such an unnecessary

amount of debt, required two things to sustain it; first, the most vigorous and economical management, and next, a readiness and ability on the part of the directors to back it in the earlier stages of its finances. Unfortunately, it has lacked both. The direction has been notoriously feeble and inefficient. The principal office was very foolishly moved away from the center of business to Boston; and the managers appear to have had other weighty interests which absorbed their attention; so that the road has been allowed literally to run itself. The scheme was undertaken as a temporary speculation, and the main anxiety of the directors appears to have been to realize on their securities as soon as possible and repeat the money-making operation on some other enterprise. And just here comes in the chief cause of the embarrassments of the managers. In order to build other roads by a similar process, the larger holders of the securities have pledged their bonds and stocks, and upon margins which held out a strong temptation for other parties to attack the market for the securities, either as a speculation, or for the purpose of getting control of the road. Apparently, certain wily and wealthy speculators have taken advantage of this weak point in the position of the directors; first, by direct selling operations on the market, and then by the adroit expedient of persuading the Government that the Pacific Railroads ought to pay up the interest it had advanced on their bonds. The depreciation of the securities, by this means, has exhausted the margins on the directors' loans, and they retain their stock and bonds only by the suzerainty of their creditors. With their securities thus placed beyond their power, and with what other means they possess locked up in other speculations, they are unable to protect themselves. Mr. Oakes Ames, who holds \$6,000,000 of stock, has suspended, carrying with him several firms implicated in his speculations; and Mr. Durant, who owns \$5,400,000 stock, has suffered serious inconvenience through the price falling much below the figures at which he had hypothecated it; while three other directors, holding each \$2,000,000, have been similarly inconvenienced.

These are the facts as to the operations and position of the directors, so far as we are able to learn from the best sources outside the "ring." They exhibit a disastrous failure of an attempt upon a grand scale to make illegitimate gains out of one of the greatest enterprises of the times. The moral of the failure is that the people have much more prudence in the buying of securities than speculators suppose. These directors, doubtless, calculated upon marketing their stock and bonds at a handsome profit. The public, however, through all the secrecy with which their operations had been covered, suspected extravagance and bad management somewhere, and have, therefore, not taken sufficient securities to save the directors from loss or possibly ruin. Had these gentlemen been satisfied with more legitimate gains, they would have commanded public confidence, and their securities would have maintained a steady value. In aiming at too much, they are likely to lose much of the capital they put into the enterprise, and they must forfeit the control of a road from which they expected to make fortunes measured by the millions. The moral well deserves the attention of railroad capitalists.

To an over-reaching attempt at private profit, however, the directors have added blundering mismanagement. They have piled up a floating debt of about five millions of dollars, all of which matures within the next three months. A large proportion of this has been borrowed in the form of foreign exchange; but the whole is protected by collaterals. Among the securities hypothecated against this debt are \$2,000,000 Land Grant bonds; \$2,000,000 of Income bonds; \$300,000 of Colorado Central Railroad bonds, and \$700,000 Omaha Bridge bonds. At the present market value of these securities, they fall to cover the loans by about one-third of the principal. It is evident, therefore, that the worst crisis both for the directors and the company has yet to come. The \$1,358,000 bonds received from the Central Pacific road have been already sold; and we are credibly informed that the company has no available securities with which to strengthen its collaterals on floating loans, even if the lenders were disposed to extend them. It has, moreover, to provide for the manufacturing of \$10,000,000 of income bonds between 1872 and 1874. These facts show a lack of judgment in the framing of the finances of the road and a subsequent inefficiency in management which leave no course but for the corporation to go into the hands of parties who better know how to manage railroad property. Under these circumstances, it would be reckless for Congress to press the issue now pending respecting the payment of back interest. The road is in no condition to pay it, and cannot possibly, until it has had ample opportunity to recover under abler management.

—An important meeting of German railway directors was held the week before Christmas, at Berlin, to take into consideration the expediency of introducing and using one uniform system of railway signals on all the lines in Germany and Austria. The general principle was unanimously agreed to, and then a discussion ensued as to the best and most practical system to adopt for the safety of life and property and the prevention of accidents by collision. The advantages and defects of the different systems in use in all the countries in Europe and America were brought forward and discussed, but the English "block system" carried off the palm as the most simple, practical and useful that could be devised for insuring safety, and was unanimously agreed to. Baron von Weber was present at the conference as the representative of Austria, and promised to make the needful report to his Government and endeavor to induce them to render it compulsory to use the block system exclusively on all the railways in the Austrian dominions.

President John W. Garrett, Proposes a New Line Between Baltimore and New York.

The regular monthly meeting of the Board of Directors of the Baltimore & Ohio Railroad Company took place on the 11th inst. at Camden Station. After the transaction of the usual routine business, President Garrett addressed the Board as follows:

Gentlemen: I have the pleasure of stating that, notwithstanding the general depression of business, the revenue of the Baltimore & Ohio Railroad and its branches amounted for the month of December to \$990,331.95—showing an increase of \$166,451.64 over the same month of the preceding year.

The completion of the splendid bridge over the Ohio River, with its approaches, one mile and seventeen hundred and sixty-two feet in length, which connects the Parkersburg Branch with the Marietta & Cincinnati Road, fills the last link which enables the company to furnish the shortest and best route between Baltimore, Washington, and the Northern cities and Cincinnati, the great West and Southwest. During the past three years more than six millions of dollars have been expended in improving and completing the Parkersburg Branch and the Marietta & Cincinnati Roads, and in constructing this bridge, so essential for the vast populations whose interests it will serve.

The equally massive and superior iron bridge to connect the Main Stem with the Central Ohio Road at Bellaire on the Ohio River, is also nearly completed, and it is expected will be opened during the month of March next.

The enterprise of capitalists seeking a port where the most remunerative results await them have caused our port to be supplied, without bounty or further investment of capital on our part, in addition to the Bremen Line of steamers, with the fine steamships which are now plying between Liverpool and Baltimore.

The gradually developing but powerful connections and organizations of interests between Baltimore and the great centres of Southern, Western and Northwestern commerce are daily producing the results which are indicated by the remarkable increase in the revenues of the company and the general business of Baltimore.

Our system of absolute independence and refusal to join in combination with the trunk lines of low and, to the greatest practicable extent, uniform rates of transportation, and the simple and economical policy of giving to the public low rates without the intervention of middlemen and the varied vampire interests that have fastened upon many of the railways of the country, are producing a most satisfactory fruition. Under this system public confidence has steadily strengthened, and the business of the road and the city is being constantly augmented. Whilst, however, our railway connections, with the great interests now so closely associated and identified with Baltimore, are accomplishing so much prosperity, and promise so much in the future—especially when so soon to embrace the great line from Pittsburgh to Cumberland—the title of which is expected to be changed, in view of its close identification with the interests of the cities named to that of the "Pittsburgh, Washington & Baltimore Railroad," there are lines connected with Baltimore which exhibit no sympathy with her interests, and the control of which is frequently exercised with severity and practical antagonism to those interests. I refer to the Philadelphia, Wilmington & Baltimore and the Camden & Amboy railways. Complaints have frequently arisen against the former for an utter disregard, in the arrangement of their time-tables with their branch roads, of the interests and wishes of the merchants of Baltimore. An illustration of the severe exactions which those lines deem it proper to make upon the trade of this city is shown by their recent course in reference to the tariff on freight between Baltimore and New York. Whilst, when the canals open rates vary from 10 to 15 cents per 100 pounds, and the highest rate charged by the railroad for heavy goods in large quantities has been until recently 25 cents per 100 pounds, the Baltimore Copper Company and other large concerns in this city have been compelled to pay recently, when those roads determined that they could not be affected by competition, 50 cents per 100 pounds.

The distance from Baltimore to Philadelphia by the Philadelphia, Wilmington & Baltimore Road is 96 miles, and from Philadelphia to New York, by the New Jersey railroads, is 90 miles, and thus those companies are now charging the merchants and manufacturers of Baltimore 50 cents per 100 pounds for 186 miles, whilst the Baltimore & Ohio Company and its connections charge, as their highest winter rate, but 55 cents per 100 pounds from Baltimore via Columbus to Chicago, 826 miles.

This enormous charge is not based upon the small and irregular business of local stations, where the largely increased cost of a limited traffic can be recognized, but it is made upon the extensive and economically-worked traffic of through business between these great commercial centers.

Authority has been given for the construction of a second road between Baltimore and Washington. The population of Washington, by the recent census, is 109,204. It has been the policy of the Baltimore & Ohio Railroad Company to charge uniform and low rates for freight service on its Washington Branch. The comparison of its policy with the Camden & Amboy Railroad will be shown by the fact that that company insists upon a charge for so-styled terminal expenses of five cents per one hundred pounds, and also that for its actual ninety miles distance it shall be allowed one hundred miles in dividing the remainder of freight earnings with the Baltimore & Ohio Railroad. The whole charge for heavy freight betwixt Baltimore and Washington is but ten cents per one hundred pounds, including the station or terminal charges for labor, etc., at both Baltimore and Washington. Thus it will be seen that the Camden & Amboy Road requires for its terminal charges one-half of the whole amount

charged by the Baltimore & Ohio Railroad Company for the entire station labor at both points and the transportation between Baltimore and Washington. The exactions of these roads for passenger travel are quite as marked.

It will be remembered that, immediately upon the decision of the Superior Court of Baltimore city upon the question of the constitutionality of the capitation tax of the State of Maryland, the Baltimore & Ohio Company reduced the charge between Baltimore and Washington from \$1.50 to \$1.20 per passenger. On the date of that decision, viz., December 9, the following telegram was sent to Presidents Hinckley, Welsh, Gazmer and Dennis, who represent the roads between Baltimore and New York:

"I have the pleasure of advising you that the Superior Court, of Baltimore city has this day decided that the capitation tax of the State of Maryland on the Washington Branch is unconstitutional.

"Although this decision is subject to the action of the Court of Appeals of this State, and probably of the Supreme Court of the United States, and notwithstanding our company has still the chartered right to charge even more than its present rate of fare, yet we desire to join you in a reduction of the fares between New York and Philadelphia and Washington. We will be happy to confer with you on this subject at as early a day as it may suit your convenience."

The Baltimore & Ohio Company had repeatedly, at previous periods, urged a reduction in the through rate between New York and Philadelphia and Washington.

These lines had professed a willingness to reduce rates to the figures proposed by the Baltimore & Ohio Company, viz., \$7.50 between Washington & New York, and \$4.50 between Philadelphia and Washington, provided the Baltimore & Ohio Company would make a less reduction than that which it now desired to make. These companies, however, refused, when this proposition was made by the Baltimore & Ohio Company, to agree to the reduction only of the difference which it determined to make in view of the public interests on the through ticket, to break up that ticket. Those roads demanded, in addition to the reduction made by the Baltimore & Ohio Company, and the risk taken by this company in connection with that reduction, a further reduction from their reduced local rates, whilst those companies insisted upon more than \$3 as their proportion.

The extreme demands of these companies for this service can be appreciated by the public when the facts are known that the Camden & Amboy, where it has the competition of the Allentown route to meet, accepts from the Pennsylvania Railway Company \$1.80 per passenger between Philadelphia and New York, and the Philadelphia, Wilmington & Baltimore Company also accepts less than \$2 per passenger where the necessities of the competition are to be met.

Up to this period the Baltimore & Ohio Company has been unable to effect any reduction on either the Philadelphia or New York tickets, except to such an extent as it was willing itself to make.

The President of this company called the attention of the President of the Philadelphia, Wilmington & Baltimore Company to the fact, in December, that those companies were charging the citizens of Baltimore and the citizens of New York \$6.50 between those cities; and, doubtless, in view of the severity of this charge, and the attention which our correspondence attracted to the subject, those companies have since made a partial reduction on this ticket, viz., to \$6.30.

With the enormous passenger business this route would command by moderate charges, a rate of \$5 between Baltimore and New York could not fail to be remunerative.

If the population of Washington requires an additional road for its travel and business, whilst the capacity of the Washington Branch, with its first-class double track, is equivalent to twenty times the business which that road can command, what are the requirements of the three great cities of Baltimore, Philadelphia and New York, with their populations, by the recent census, respectively, 267,354, 657,277 and 926,690? These populations are constantly increasing, and if reasonable rates were charged between these cities, an immense enlargement of business would follow.

It is palpable, therefore, that to free this community and those cities from the excessive demands made by the existing companies for their service, that a new, double-track, first-class road should be built between Baltimore and Philadelphia, and Philadelphia and New York. Eminent capitalists in each of these cities have, for some time past, felt convinced of this fact, and the action of these companies daily proves more and more the necessity of a great connecting line. Baltimore is especially interested in such an improvement. Washington and the South and West will also be greatly benefited by the construction of this line, which will aid in establishing the grand and favorite route for travel by the national capital and Baltimore (especially with the advantage of the direct and important Metropolitan Branch road) to Philadelphia, New York and the New England States. A line is now being constructed which will open an interior route from Martinsburg, via Harrisburg and the Allentown Line, to New York.

Another road is projected which will strike the Baltimore & Ohio road at Hancock and open an additional line from that point to New York. The policy of the Baltimore & Ohio Company to continue to command the great business of the West and South to Baltimore, and through Baltimore, when so required, to the Eastern cities, can only be maintained by having a competitive line between Baltimore and Philadelphia and New York with such facilities and arrangements as will continue to give the requisite comparative advantages to the great route.

It is an historic fact that the roads between Baltimore and Philadelphia and New York, have never exhibited any practical interest in the vast works which

the enterprise and capital of the Baltimore and the Baltimore & Ohio companies have achieved in forming the great connections and commanding the business resources which have built up her commerce and prosperity.

Up to this hour the President of this company is not aware that those interests have ever contributed a single dollar to aid our Southern and Western connections, from which they have heretofore so largely profited. Therefore, whilst the proposed new lines will have the cordial friendship and co-operation of the vast mercantile and property interests of the great cities whose population and business are to be so benefited, there is no reason why the great tributaries built up under the influences and with the capital of our people should not transfer any portion of their business that may be mutually desirable and profitable to the important line which it is proposed to construct.

The demonstration of the necessity of such a line has been so marked, it is anticipated, under existing legislation, and legislation which can now be readily procured from the States whose citizens throughout their territories will be so favorably affected by its construction, that the new road can be effectively established.

Mr. Garrett had no hesitation in saying that numerous great and leading interests of the more than two millions of population of the cities and regions affected will be so largely benefited as to demand the early authorization of the enterprise.

It is gratifying to be able to state that there is reason to believe there will be no difficulty, when the proper charter arrangements are perfected, in securing the capital from individual sources which will accomplish this great and needed work. The capital upon which the New Jersey & Philadelphia, Wilmington & Baltimore Companies pay interest and has become so exaggerated that the new work will possess financial advantages that of themselves will cause it—with the great business that it will command, and which must increase—to be a desirable and remunerative investment. Plans have already been initiated which, it is hoped, will lead to the early success of the enterprise, and the subject will doubtless promptly attract the attention, interest and assistance which its great importance demands.

Improvements of Canadian Canals.

In reply to queries put by the newly appointed Canal Commissioners, the Hamilton Board of Trade made the following suggestions:—

That the depth of water be increased to twelve feet; that the locks should be enlarged, so as to permit vessels to pass of from 230 to 350 feet in length and from 30 to 40 feet across the beam, with a draft of water of twelve feet, and carrying to the capacity of 30,000 bushels of wheat. By this enlargement a reduction on the rates of freight between Chicago and Kingston and Oswego of about twelve and a half per cent. could be effected. The improvement of the canals should commence at Montreal with the Lachine Canal and proceed westward, with a view of drawing the traffic of the Great West by the St. Lawrence route. A canal on the Canada side of the Sault Ste. Marie is strongly recommended. The impolicy of allowing the trade on the north shore of Lake Superior to be dependent on the use of the United States canals is strongly dwelt upon.

The report concludes by saying the people of the Dominion owe to themselves, as the guarantee of a noble heritage, to see that the American people on the shores of the great lakes have every facility given them freely to use the Welland, St. Lawrence and Lachine canals, on the same terms as our own people, with a view to assist in developing the produce traffic that annually rolls its increased and increasing volume from the West to the Atlantic.

—In the following letter, received by a telegraph operator at Indianapolis, the writer seems to intimate that he would be willing to study the art of telegraphy:

"Mister —

Operator

Dear Sure

i seat miself an take mi penn in han two rite to you i want two Operate an as i kant git the operator at this stashun to larn me i thot i wood rite two yo an see what yo wood charge me two larn me two Operat I am stang at Pat Bushis an i dont like selyvil mutch, as yo hav larn sum fellur two Operate i thot mabbee yo wood larn me two Operate. i hav got about un hundred dollars in munny an i want two larn me two Operate an i must not use mutch of it or i cannot hav anuf to pay yo an mi bord now what will yo take two larn me two Operate. i ges i can git sum mashenes of a mister bowers he Thinks he wil bee dun with them in a week or two now yo will see that i kan rite a purty gud han an the operateur heer says that is all a fellur kneads two mak a gud Operatur now mister — please tuo rite tuo me an let me no whether yo kan larn me to Operat or not for if yo kant larn me tuo Operat i ges I will goe tuo indinopolis to Komershel skule to larn tuo Operate now please jest rite tuo me what yo will ax tuo larn me two Operat I will klos yors truly

Silyvil indana
vegow Co —"

The Indiana *Sentinel* suggests that a box of blue pills might gratify the young gentleman.

General Railroad News.

OLD AND NEW ROADS.

Midland of Canada.

This railroad, which has hitherto been open from Port Hope, a town on Lake Ontario 63 miles east of Toronto by the Grand Trunk Railway, northwestward 43 miles to Lindsay has been extended about 30 miles to Beaverton, on Lake Simcoe.

Chicago & Iowa.

About twelve miles of track from Rochelle towards Oregon were laid by Friday of last week, and it was then thought that the line would be completed to Oregon by the end of this week, but the storm, doubtless, has put an end to this hope.

Springfield & Illinois Southeastern.

The Springfield State Register having given currency and credence to a rumor that the part of the above road between Edgewood & Shawneetown was about to be transferred to the Illinois Central Company, the Springfield State Journal says that the report "is not only false, but without any foundation whatever. The road is being pushed toward Beardstown as rapidly as the weather will permit, and will reach Ashland, at the crossing of the Jacksonville & Bloomington Railroad, in a few days, when a train will be put on connecting north and south with that line. The link from Edgewood to Pana will be built next summer, which will make this road the great through thoroughfare from the southeast corner of the State, on the Ohio River, to Beardstown on the Illinois River, a distance of 225 miles; and which the company propose to hold any work as an independent line of road."

Dubuque & Minnesota.

Alamakee County, in the northeast corner of Iowa, has raised \$40,000 for this road, and work is to be commenced on the line within its borders as soon as practicable.

Houston Tap & Brazoria.

Governor Davis, of Texas, advertises that he will cause the road to be sold to the highest bidder, at Austin, Texas, on the 15th of February, to satisfy its indebtedness to the school fund of the State. This road extends from Houston southward about 50 miles to Columbia, a town on the Brazos River about 20 miles from its mouth.

Richelleu, Drummond & Arthabaska.

This railroad is to extend from Sorel, at the junction of the St. John and the St. Lawrence rivers, about 100 miles below Montreal, southeastward to Acton, a station on the Grand Trunk, 54 miles east of Montreal. Already about 200 men are at work on the line, getting out timber, ties, &c., for construction, and as soon as the snow is off the ground, grading will be commenced. The bridge over the Yamaska River is in course of construction—the space is 700 feet. It is the intention of the contractor to have the whole 66 miles of road completed within 100 days from the time of breaking ground in the spring.

Milwaukee & St. Paul.

There was considerable dissatisfaction among stockholders recently when dividends were made in stock lately, and the late announcement that the company will issue 4,000 shares of common, and 4,000 of preferred stock, for the purpose of paying for the 29 miles of road which connects their Minnesota line at the Iowa boundary with the Iowa Central at Mason City, has not been received very cordially by some operators on Wall street. This is at the rate of about \$27,500 per mile, and it ought to be worth that, certainly, especially in stock worth on the average 63 in the market.

Oshkosh & Mississippi.

At the annual meeting on the 14th, \$127,000 of stock were represented. A first installment of 5 per cent. has been paid, and now a second installment of 10 per cent. is called, to be paid by the middle of February. Contracts for grading and ties will be let as soon as possible, and it is believed that the section between Oshkosh and Ripon, 18 miles, will be in operation by the 1st of July next.

Union Pacific.

During the great storm of the 14th and 15th, which blockaded so many lines in the Northwest, this road remained unobstructed.

On Monday last twenty cars of silver ore, from Utah, were brought over this road to Omaha, on the way to Swansea, Wales, where the ore is to be reduced.

Philadelphia & Reading.

The annual meeting of the company took place in Philadelphia. The annual report was submitted, showing gross receipts for the year ending Nov. 31, 1870, \$11,208,381; gross expenses for the year, \$6,876,313.

The rolling stock consists of 309 locomotives, 101 passenger cars, and 15,684 coal and freight cars. The company now owns six steam colliers. Although the main line of the road is not quite a hundred miles long, it had altogether, at the beginning of the last fiscal year, 183 miles of double-track road, 382 miles of single-track road, and 394 miles of sidings and laterals.

Chicago, Pekin & Southwestern.

The Peoria (Ill.) Transcript of January 13 says: "Day before yesterday we published what purported to be a list of the newly-elected directors of the Chicago & Pekin Road, elected at a regular meeting of the stockholders, at Marseilles. Now, another meeting of stockholders, claiming to be regular, has elected the following Directors: Joel H. Wicker, C. G. Wicker, J. S. Meckling, F. E. Hinckley, H. E. Hamilton, J. L. Stark, of Chicago; Ed. Wilcox, of Minonk; Thomas King, B. S. Prettyman, George Greigg, Leander King, James Haines, and Geo. B. Foster, of Pekin. After the election, this board organized by the choice of B. S. Prettyman, President; Joel H. Wicker, Vice-President; George Greigg, Treasurer, and H. P. Finnegan, Secretary. For some time past there has been a difficulty in the management of the affairs of the corporation, and we presume this action will result in a law-suit, to determine who is entitled to possession. The fight seems to be principally as to whether Chicago or Pekin shall control the road."

Winona & La Crosse.

A bill has been introduced into the Minnesota Legislature to incorporate the Winona & La Crosse Railroad Company, providing that all rights and franchises granted in 1856 to the Winona & La Crosse Railroad Company be revived, and the new company authorized to proceed to the construction of their road to La Crosse, opposite La Crosse, and thence to the State line. This will form a line in Minnesota just parallel with the La Crosse, Trempealeau & Prescott Road, which the Northwestern has just completed, in Wisconsin. Should the Milwaukee & St. Paul Company secure control of, or running rights over, the St. Paul & Winona Road, it will need the proposed road to connect with its Wisconsin line at La Crosse.

Central Pacific.

This company has procured a great steam ferry-boat, the "Thoroughfare," which was to commence its trips across San Francisco Bay between the city and the railroad terminus, by the arrival of the next steamer from China. By its cargoes can be transferred at the rate of 1,000 to 1,500 tons per day, and the freight time between Japan and Chicago will be reduced to 34 or 36 days to Chicago, 37 or 40 to New York, and about 50 to Liverpool.

Maine Railroads.

The Governor of Maine, in his last message to the Legislature, made the following statements in reference to the railroad system of the State:

"The grant to the European & North American Railway secures the early completion of that road, which will open direct railroad communication with the Gulf of St. Lawrence, and at an early day, by a line building, to Halifax. A continuous line of railway will then extend the whole length of the continent, connecting the Atlantic and Pacific Oceans. The great thoroughfares between Europe and the West of the American continent and the Pacific will then be through this state. A railroad enterprise is also pushing its way westward from Portland to the grain-growing states of the West. While we should avoid a railroad war, the address takes strong grounds in favor of pushing these enterprises. Six hundred and ninety-four and three-quarters miles of railroad are in operation in the state, and 186 miles are under construction. Seventy-eight miles have been built the past year."

Vermont Central.

This company has concluded negotiations with the Pullman Car Company, by which the entire lines are to be equipped with the Pullman parlor and sleeping cars for both day and night service. This means a good deal, for by recent leases the Vermont Central operates nearly all the railroads in Vermont.

Toledo, Peoria & Warsaw.

In the January 14 number of this journal the cost per mile run for locomotives on the Toledo, Peoria & Warsaw Railway, for the month of November, was incorrectly given as 24.79 cents. It should have been 20.61 cents.

Leavenworth, Atchison & Northwestern.

A dispatch from Leavenworth dated January 13th, says: Judge Dillon of the U. S. District Court has granted an injunction restraining the city authorities of Leavenworth, Kansas from further interruption of the Leavenworth, Atchison & Northwestern Railroad, and permitting the railroad company to repair the track and resume operations. Judge James McCahn,

employed by the city to prosecute the case against the company, and who argued the case before Judge Dillon on Saturday, died last night from over-taxation of the brain.

Mount Pleasant & Bradford.

This road was some time since leased by the directors to the Pittsburgh & Connellsville Railroad Company, and, on the 9th inst., the stockholders met and ratified the lease by an almost unanimous vote. The old board of directors was also re-elected.

Pittsburgh & Connellsville.

It is expected that the track will be laid to Ohio Pile Falls, 21 miles southeast of Connellsville, very soon. Passenger trains are now running from Connellsville to the end of the track. Pinkerton tunnel is finished, and in a few days the track layers will commence putting down rails in the mountain or Sand Patch Tunnel, which is 4,700 feet long. When once the Ohio Pile Falls is reached the heavy work will be finished.

Pittsburgh & Virginia.

The company was chartered by the Pennsylvania Legislature, April 14th, 1870, and is authorized to construct a road along the east side of the Monongahela River from McKeesport, in Allegheny County, to the West Virginia state line, there to connect with any road authorized by the latter State. It is further authorized to use its capital in extending its branches or otherwise to such points in West Virginia or Virginia as those states may permit by legislation. The officers and directors lately elected are given in another column.

Macon & Western.

Mr. A. J. White, President, reports for the year ending November 30, 1870: The road has earned \$692,584.87, and spent \$441,311.32. Clearing net earnings, \$251,273.33. The balance on hand from last report was \$185,665.62. In January and July \$225,000 dividends were paid. There are \$154,060.98 on hand to pay January, 1871, dividends. The business has increased over 1869, \$109,851.09, and 1869 over 1868, \$99,199.38. The capital stock has been increased by the Legislature \$1,000,000. It is now \$2,500,000. This company has leased the Upson County Railroad for twenty years, and is operating temporarily the Savannah, Griffin & North Alabama Railroad.

The Pennsylvania and Southern Railroads.

The Washington correspondent of the Cincinnati Gazette discusses, as follows, the indications of the late lease of the Western & Atlantic Railroad by a combination of Northern railroad men:

"The leasing of the Georgia road by Cameron, Delano and Thomas Scott, marks a new step in a consolidation with Southern lines. The Pennsylvania road is now completing a direct line to this city from Philadelphia. At its last session Congress gave this company perpetual rights of way over the Long bridge here, and virtually gave it the bridge. It already controls the line to Richmond by way of Fredericksburg. Westward it already reaches to Cincinnati, and its Newport Bridge points on to its connection with the line just leased from the State of Georgia. Steps are in progress to secure the Virginia & East Tennessee Road in the same interests. The magnitude of the scheme will at once appear from these outlines."

Cumberland Valley.

This road has been completed to Williamsport, Md., so as to connect with the Chesapeake & Ohio Canal, and work is now progressing on the newly chartered railroad from the Potomac River to Winchester, Va., a distance of thirty-one miles, known as the Martinsburg & Potomac Railroad, of which Hon. Charles J. Faulkner is President. At Winchester this road is to connect with the proposed road through the valley of Virginia to Salem, on the Virginia & Tennessee Railroad, and when this link is completed between the Potomac River and Winchester, a continuous line of railway through this fertile valley, under the management of the Pennsylvania Railroad, will be in operation, and, with the connection complete to Salem, almost an air-line route to New York and Philadelphia will be assured to Southern trade. It is believed that this connection will be accomplished before the first of January, 1872.

Chicago, Danville & Vincennes.

Mr. L. W. Robbins, Chief Engineer, is now at work in Vermillion County, Ill., running the line from Rossville to Danville. The Terre Haute & Danville road, which will connect with the first-named road somewhere below Danville, at the Indiana line, is completed from Terre Haute to Newport, about 26 miles from Danville, and 12 miles more is ready for the iron, to Perrysville, Indiana.

Texas & New Orleans.

This railroad, which extends from Houston, Texas, eastward to the Louisiana line, 108 miles, has failed to

meet its indebtedness to the school fund of Texas, in consequence whereof Governor Davis advertises that it will be sold at auction at Austin on the 4th of February. The line, we believe, is in a sadly dilapidated condition and has not been operated since the war. Completed to a connection with a line to New Orleans it could hardly fail to be valuable.

The Parkersburg Bridge.

An exchange says: "The first passenger train passed over the bridge across the Ohio, at Parkersburg, on the 9th instant. The bridge was informally opened a few days before, by running an engine across. No ceremony was used on the occasion, but it is promised that a celebration befitting the grandeur of the work will be held in a short time. With the exception of a few land piers, the foundation has been built in nineteen months. Mr. W. E. Porter, of the Baltimore & Ohio Railroad, has had the charge of this work, and its early completion reflects great credit on his energy, perseverance and skill. The bridge proper is nearly one mile in length, and with its approaches, consisting of heavy cuttings and embankments, extends two miles."

TRAFFIC AND EARNINGS.

—A Cincinnati delegation had a consultation with Secretary Boutwell, lately, in regard to giving efficiency to the Port of Entry bill. The Secretary, after hearing a statement of the practical difficulties, agreed that he would so modify the present regulation as to allow any one of several connecting lines of transportation to give bonds and carry goods over the whole line. He also agreed that instead of requiring importers to give a separate bond on each invoice, he would allow them to give bonds covering all extended points, and at each shipment charge the amount on the bond, and, when importations equal the whole amount of the bond, cancel it, and take another. The Secretary said he was willing to do all in his power to make the execution of the law practicable.

—The following is the report of earnings of the Great Western Railway of Canada for the two weeks ending December 16 and 23:

	Dec. 16.	Dec. 23.
Passengers.....	\$24,490 00	\$25,276 37
Freight and Live Stock.....	64,216 38	60,813 40
Mails and sundries.....	2,114 79	2,344 21
Total receipts for week.....	\$90,821 14	\$88,333 90
Corresponding week, 1869.....	80,944 06	87,964 76
Increase.....	\$ 9,907 12	\$ 369 14

—The Grand Trunk Railway reports its earnings for the week ending December 24, as follows:

	1870.	1869.
.....	\$31,700	25,500
Increase (21½ per cent.).....	\$ 6,200	

MISCELLANEOUS.

—Work has been commenced on a bridge across Lake Champlain, at Ticonderoga, and the people of Whitehall are trying to prevent it, arguing that it will materially interfere with navigation on the lake.

—In Hungary, the local Parliament has voted to expend 22,000,000 of florins for the construction of new railroads in 1871.

—Alexander H. Stephens wrote two letters to the Georgia newspapers last week. The first letter approved the proposed lease of the railroad belonging to the State, and the second letter withdrew the approval. He had "suddenly been put in possession of some facts" showing that the highest bid had not been accepted by \$11,500.

—Hon. Josiah Quincy has petitioned the Massachusetts Legislature to compel railways terminating in Boston to run cheap trains, for the accommodation of workmen and women.

—*Herapath's Journal* points out as an effective improvement of English railroad properties the reduction of the speed of trains, saying: "It would have a most potent influence on the rate of dividend, would be easy of accomplishment, would tend greatly to the prevention of accidents, and would therefore tend to promote traffic while reducing working expenses prodigiously."

—A correspondent of an English railroad paper condemns the establishment of shops for the construction of rolling stock by railroad companies. He says he "holds it as a principle, that railway companies ought not to be manufacturers of any article they can purchase in the open market, under the competition of private enterprise."

—Under the head of "Adventurous Travelers," the New York *Times*, after describing the late balloon voyage from Paris to Norway, says:

"As novel and exciting, if not more painful, was the trip made the other night by the fireman of a Connecti-

cut road on the cowcatcher of his engine. While engaged in oiling the machinery he fell, and, being caught and held on the pilot by a few threads of his Cardigan jacket, was, in that position, dragged for four hundred feet before he was dislodged. The wonderful part of it is that his injuries are comparatively slight, and that no bones were broken."

—A short time ago the engineer of a train on the Boston & Albany Road, having run down a market wagon, stopped the train as soon as possible to learn the result of the accident. Upon dismounting and looking on the platform connected with the cowcatcher, he found a respectable looking man, well muffled up, with a bag of oats and a tub of butter by his side, sitting very composedly, apparently on his way to market. He was not hurt in the least, though his team was made into kindling wood.

—The decision of the Supreme Court of Cincinnati, in general term, announced by Judge Taft upon the application of the City Solicitor for an injunction to restrain the payment of money under the provisions of the act authorizing the construction of the Cincinnati Southern Railroad, assumes that the question of the importance of the Southern Railroad to Cincinnati is sufficiently settled by the act of the Legislature authorizing the city to construct it, by the acts of the City Council, and by the overwhelming popular vote of Cincinnati in its favor. The restrictions of the Constitution against aid to railroads, by cities, was for the purpose of neutralizing the extension of such aid to private corporations, but did not operate to prevent a city from building a railroad itself, which was a work of public importance to the city. The Constitution prevents giving aid to corporations, but allows a city to construct, by its own agents, the necessary improvements. The objection that this railroad lay mainly outside of Cincinnati, and outside of the State of Ohio was plausible, but not fatal. On the whole case the court was clearly of the opinion that the acts of the Legislature in regard to the Cincinnati Southern Railroad are constitutional and valid.

—Since the great robbery, the Central Pacific Company have arranged the couplings of the cars in such a manner that they cannot be detached by any ordinary means without severing the heavy iron link or the pin. As an additional safeguard, they have substituted a copper wire rope in the place of the usual style of rope to the signal bell of the locomotive, which passes through the train overhead. This rope cannot be readily cut, as on the occasion referred to, and any attempt to twist it off or break it would only ring the signal bell for the train to stop.

—The loss to holders by the recent fall in the Union Pacific securities is estimated at about \$16,000,000.

—We have not reached absolute perfection in America, in warming railroad cars, we must confess, but the perusal of the following, in *Herapath's Journal*, reminds us that we are at least better off than our English cousins when the thermometer is below zero. It is headed "Footwarmers":

"It is certainly great misery in cold weather to travel long distances by railway without the comfort of a footwarmer, nor can we doubt that the general provision of this accommodation to all classes of travelers would operate to increase traffic. But railway companies cannot be expected to provide footwarmers for nothing. A small charge would, however, cover the expense of footwarmers, and even add directly to the net income of the companies."

ELECTIONS AND APPOINTMENTS.

—The following trustees of the Atlantic & Pacific Telegraph Company were elected Tuesday, January 10th, at the annual meeting:

John Allen, Jr., Buffalo, N. Y.; Oliver Ames, Boston, Mass.; Cheney Ames, Oswego, N. Y.; C. S. Bushnell, New Haven, Conn.; W. Blair, Chicago, Ill.; Elisha Brooks, New York; James Brooks, New York; Edward Burckhardt, New York; Abijah W. Chapin, Springfield, Mass.; Sydney Dillon, New York; John Duff, Boston, Mass.; W. L. Evans, Cincinnati, O.; H. M. Flagler, Cleveland, O.; T. J. S. Flint, Chicago, Ill.; Rufus R. Graves, New York; George Griswold Gray, New York; Wm. H. Guion, New York; Rowland G. Hazard, Peacedale, R. I.; John S. Lyle, New York; S. M. Marks, Lockport, N. Y.; James N. Mathews, Buffalo, N. Y.; C. H. McCormick, New York; S. D. McMillan, Cleveland, O.; John H. Mortimer, New York; O. Noble, Erie, Pa.; Allen Munroe, Syracuse, N. Y.; Alfred Nelson, New York; Samuel U. F. Odell, New York; Lansing Pruyn, Albany, N. Y.; James Sayre, Utica, N. Y.; W. D. Snow, New York; Angus Smith, Milwaukee, Wis.; Henry A. Smythe, New York; Henry M. Taber, New York; E. H. Van Kleeck, New York;

John G. Vose, New York; A. F. Wilmarth, New York; H. D. Walbridge, New York; Horace S. Walbridge, Toledo, O.; C. A. Lambard, New York.

—The meeting of the stockholders of the Oshkosh & Mississippi Railroad Company, for the election of officers and reorganization of the company, took place in Oshkosh, Wis., on the 14th inst. President Stringham in the chair. The following Board of Directors was elected: For one year—E. James, O. Beach, I. P. Sheldon, C. N. Paine, George Badger; for two years—D. L. Dibby, John Buckstaff, Jr., John C. Foster, J. Dobbs, A. M. Skeels; for three years—Joseph Stringham, James Jenkins, Simon B. Paige, S. W. Washburn, John McMullen. The Directors elected the following officers: President, James Jenkins; Vice-President, S. W. Washburn; Secretary, George Gary; Treasurer, S. B. Paige. By order of the Directors, 10 per cent. of the stock, in addition to the first installment of 5 per cent. has been called for, and must be paid within thirty days.

—At a meeting of the stockholders of the Buffalo, Corry & Pittsburgh Railroad Company, held at Mayville, N. Y., on the 16th inst., the following Board of Directors was elected: Horace F. Clark, Augustus Schell, Samuel F. Barger, Edward K. Carl, of New York; George R. Gates, of Buffalo; Thomas Struthers, of Warren, Penn.; Wm. N. Stewart, of Corry, Penn.; Daniel Williams, of Nashville, N. Y.; M. P. Banins, Wm. P. Whiteside, George W. Gifford, J. F. Phelps, and A. K. Warren, of Mayville, N. Y. Hon. M. P. Banins was elected President and Treasurer.

—The following officers of the Philadelphia & Reading Company were elected: President, Franklin B. Gowen; Managers, H. Pratt, E. N. McKean, E. Borie, R. B. Caben, J. B. Lippincott, John Ashurst, Charles E. Smith; Treasurer, Samuel Bradford; Secretary, J. W. Jones. Nearly all are re-elections.

—The Atlantic & Lake Erie Railway Company of Ohio have elected the following named Directors: D. W. S. Migart, Bucyrus; K. B. Stewart, Athens; Hon. D. Richards, Mount Gilead; R. E. Huston, New Lexington; J. P. Westbee, Athens County; A. Seffel, Wyandot County; J. B. Johnson, Granville; A. Lasdale, Wood County; James Foster, Fostoria, and the Hon. V. B. Harton, Pomeroy.

—The stockholders of the Philadelphia & Trenton Railroad Company met in Philadelphia on the 9th inst., and elected the following Directors: Vincent L. Bradford, William H. Hart, William H. Gatzmer, Charles Macalester, William S. Freeman, Asa J. Fish, John G. Stevens, Benjamin Fish, John M. Read, Ashbel Welch, Albert W. Markley, G. Morris Dorrance. And at a subsequent meeting of the Board of Directors, the following officers were elected: Vincent L. Bradford, President; J. Parker Norris, Treasurer; Floyd H. White, Secretary. James Morrell, Esq., for nearly forty years Secretary of the company, being retired on account of age and infirmity, was appointed Emeritus Secretary of the company.

—The following Directors of the Lehigh Valley Railroad Company were elected on the 9th inst.: Charles Hartshorne, Wm. W. Longstreth, J. Gillingham Fell, John Taylor Johnston, William H. Gatzmer, David Thomas, Ashbel Welch, Edward H. Trotter, Ario Pardee, William L. Conyngham, Edward Roberts, William A. Ingham. Mr. Asa Packer was elected President; Charles Hartshorne, Vice-President; Lloyd Chamberlain, Treasurer; and John R. Fanshawe, Secretary.

—At the annual meeting of the stockholders of the North Pennsylvania Railroad Company, held on the 8th inst., the following Directors were elected: John Jordan, Jr., S. Gillingham Fell, Wm. C. Ludwig, Ellwood C. Shannon, Edward C. Knight, Alfred Hunt, Wm. C. Kent, Charles W. Wharton, Edward Roberts, Thomas Smith. Mr. Franklin A. Comly was chosen President, and Edward Armstrong, Secretary.

—The Pittsburgh & Virginia Railroad Company was organized, on the 7th inst., by the election of the following Directors: Wm. E. Frazer, Jr., L. C. Baldwin, Wm. J. Manown, John S. Van Voorhis, H. B. Frye, all of Fayette County, Pennsylvania; Robert C. Shemertz and William R. Sweitzer, both of Pittsburgh. At a subsequent meeting of the board, the following officers were chosen: Wm. E. Frazer, Jr., of Fayette City, President; Geo. Holtzman, of Pittsburgh, Secretary; H. T. Blythe, of Fayette County, Treasurer.

—The annual meeting of the Lawrence Railroad Company was held on the 9th inst., in Pittsburgh, and the following gentlemen were elected Directors: Wm. McCreery, G. W. Cass, J. N. McCullough, Thomas D. Messler, and Wm. Harbaugh, of Pittsburgh; A. L. Crawford, of Newcastle, and John Larvill, of Wooster, Ohio.

—Mr. Bliss, of the firm of Morton, Bliss & Co., bankers, New York, has been elected President of the Union Pacific Railroad Company in place of Oliver Ames, resigned.

—S. T. Emerson, for a long time Division Engineer of the Illinois Central Railroad with headquarters at Amboy, has been appointed Chief Engineer of the North Missouri Railroad, which seems to have an insatiable appetite for good railroad men from Illinois.

—Mr. Herman Holmes, formerly traveling agent of the Pittsburgh, Fort Wayne & Chicago Railway has been appointed traveling agent of the Rockford, Rock Island & St. Louis Railroad, with headquarters at No. 20 North Fourth street, St. Louis. Mr. Holmes worked for the Fort Wayne road four years and is widely known in the Northwest, so that he is well acquainted with his field as well as his business.

Mobile & Ohio Car Trucks.

A correspondent of the *National Car Builder* describes as follows the passenger and freight-car trucks and the coupling and bunting apparatus in use on the Mobile & Ohio Railroad:

First, as regards the *four-wheeled passenger-car truck*. The distance between centers of axles where double springs are used is sixty-five inches, and where triplets are used, sixty-nine inches. On each side of the truck are two equalizers, four inches by one, forged to fit and clasp the journal-box, one of which is on the inside and the other on the outside of the pedestal, and both are kept in place by flanges cast on the journal-box. To guard against accidents from the failure of hangers and pins, safety-straps pass under the sand-board, up inside of and over the transoms, and are turned up to carry the casting for the brake-hangers. Two volute or rubber springs rest on castings on the equalizers, and support the truck side-frame, and are placed inside of and close to the pedestals. The brakes do not slide, but are hung between the wheels, and the brake-beams are made long enough to fall on the equalizers should the hangers or safety-chains give way. As there is but little strain on the truck side-frame outside of the rubber or volute springs, it is cut away over the journal-box, thus bringing the upper floor of the car down nearly or quite, if desired, to the flange of the wheel. The springs used for the swing motion are compound elliptic, from thirty-eight to forty inches in length. They are either couplets or triplets, and each spring is composed of two outer and two inner ones, the former having from three to five, and the latter from two to four, three by five-eighths leaves. The inner springs are concentric with the outer ones, but inverted and kept in place by flanges on the ends, which permit them to play freely upon and act uniformly with the outer ones.

The *six-wheeled passenger-car trucks* are ten feet six inches between centers of outside axles, and are constructed upon the same general principles as the four-wheeled ones, except that two volute or rubber springs are placed on the equalizers between the middle and the outside pairs of wheels on each side, and connected by a knuckle joint so as to distribute the weight properly, and allow space for the brakes to play between the wheels. The outside wheels are thirty-three, and the middle ones twenty-eight inches in diameter. This allows the side bearings to be placed over the middle wheels, and the car-body is at the same time brought much lower than usual. The passenger car platforms are level with the upper floor of the cars.

The *freight-car trucks* are of the ordinary form of iron truss, with swing motion, and volute or rubber springs on the sand-board, but without springs over the journals. The wheels or journal centers are five feet three inches apart. Safety-straps similar to those used on four-wheeled passenger-car trucks are used to guard against accidents from the failure of swing-beam hangers and pins, and to carry the casting for the brake-hangers. To prevent the brakes from falling on the track, should the hangers or pins fail, the pins which pass through the lower ends of the swing-motion hangers are made sufficiently long to catch the brake-beams. The freight-car coupling and bunting apparatus is made of two beams of wood, four inches by five, extending the whole length of the car, with a cast-iron bunter-head strapped on and bolted through these beams. The beams are placed three and a half inches apart, and a curved recess is cut out to fit the springs, which are six inches long and five in diameter. The bunting is done on a projection cast on the top center-plate, and the springs, after being compressed with a pressure of about two tons, are fastened in place by filling in the space between the two long wooden beams with short pieces of scantling and securely bolting them together. Four bunter springs are used to each car—one on each side of each top center-plate—and the shock in bunting is divided between the truck and car-body, and at the same time transmitted to the rear cars. This form of bunter entirely dispenses with the heavy and expensive wrought-iron forging ordinarily used, and obviates the trouble of "pulling out bunters" and losing bunter springs on the road. All bolt-heads and nuts that come in contact with iron are kept tight by starting the metal by the side of the bolt-head and nut, after being properly screwed up. If necessary afterward to take off the nut, the metal can be easily flattened. This is a great measure prevents nuts and bolts from working loose where they come in contact with iron.

It is difficult to describe details of intricate mechanical construction without the aid of drawings, but I trust the above brief description of the peculiarities of the trucks referred to will give your correspondent a tolerably correct idea of them. In conclusion, I desire

to point out more particular *what is new* in the construction of these trucks, or what seems to me to be new after more than thirty years' experience and observation the matter in of railway rolling stock. I claim as new features:

First, the form and use of two equalizers placed on the inside and outside of the pedestals of passenger-car trucks, and the manner of keeping them in place. Two equalizers have been used on engine-trucks for twenty-seven years.

Second, the long brake-beam and its arrangements to fall on the equalizers, should the brake-hangers or safety-chains fail. This arrangement is entirely different from the *sliding-brake* on the New York Central Railroad.

Third, the compound elliptic spring, by which that form of spring is strengthened at its weakest point without impairing its elasticity.

Fourth, the form of safety-strap to carry the brake-hanger casting, and to guard against accidents from the failure of the spring-motion hangers and pins. Safety-straps to accomplish this object have been in use many years.

Fifth, the long pin through the lower ends of swing-motion hangers of freight-trucks to catch the brake-beams. Also the projection on the top center-plate, and the use and plan of arranging the four bunter springs on freight-cars. The wooden beams with the cast-iron bunter-head strapped and bolted on, have been in use twenty-three years.

Sixth, in the use of smaller wheels in the middle of a six-wheeled truck, and the knuckle joint connection between the two side springs, to distribute the weight properly between the middle and outer wheels, and to allow space for the brakes between the wheels.

A Novel Scheme for Securing Railroad Competition.

A novel method of securing competition among railroads is something the suggestion of which, at this late day, is calculated to excite surprise. The Board of Railroad Commissioners of Massachusetts have, however, undertaken to do it, and the development of their plan constitutes the essential feature in their report for the year 1871. Not only have they undertaken the task, but they have fortified themselves in their attempt by a formidable array both of facts and statistics, drawn from practical experience elsewhere.

The curious results produced by what is called competition in transportation by rail have frequently been discussed in the columns of the *Nation*. Year by year, this system is working its way out to its logical conclusion, which is now becoming alarmingly apparent. A few weeks ago, representatives of three of the great trunk thoroughfares between the West and the East met in conclave, and concluded a solemn treaty. The war of rates was to cease; competition was to be an indiscretion of the past, and combination was established as the law of the future. The several corporations were not, indeed, to "pool" their profits, and so merge themselves into one closely cemented monopoly. This final lesson of experience was reserved for a not very remote future; for the present they simply swore a peace, sure, before long, to vanish in a new war. Meanwhile, what was this very competition thus brought to a close? How far did it extend? What, are, indeed, the limits of any competition between private railroad corporations? This subject, even yet, is little understood, and there is a species of cant about it which the experience of years seems unable to dissipate. A real and healthy competition, under an active law of supply and demand, is one which permeates the whole community, and the advantages of which are participated in by all persons and in all places. It does not create an unnatural fulness in one locality, to be balanced by a corresponding dearth in another; it does not give control of the markets of the world to the residents in one section of the same country, and surrender those of another wholly to the mercies of a monopoly; it does not produce wild fluctuations, running perhaps through hundreds per cent., subject to no law, and brought about without notice; it does not admit of conventions and combinations, and "poolings of profits"; it does not defy all calculation, and, in the twinkling of an eye, transform the feast of to-day into the famine of the morrow. All these rapid changes and strong contrasts are, however, produced by what is misnamed the competition of railroads.

The reason of all this is obvious—it is equally obvious that the difficulty is one inherent in the system. There are two insuperable obstacles placed by the nature of things in the way of a full and healthy operation of the laws of supply and demand on any system of transportation by rail carried on through a medium of private corporations. In the first place, the number of these corporations cannot but be very limited—so limited, indeed, that combinations is always perfectly practicable. In the second place, competition is necessarily confined to competing points. The first of these limitations has been so much dwelt upon of late, that it may now be considered as fairly established in the popular mind. The second is rapidly working itself into general acceptance. Every one at all interested in railroad investments is perfectly familiar with the suspicion with which capitalists regard every road which makes a great display of heavy receipts from through business. Competition, experience has taught them, eats up all their profits—the more they do, not seldom the poorer they become. It is the local business which makes dividends certain, and it does so because the local business is not subject to competition. In plain English, it is a sure monopoly. Competition is thus at best confined to points where railroads converge; and throughout the country, irrespective of population, not one place in twenty on our railroads is a point of convergence, and, consequently, not one point in twenty enjoys any competition, or experiences, except in some remote degree, the operation of those laws of supply and demand to which we have been contented to leave all regulation

of our railroad system. The community now, therefore, as the result of thirty years of experience, finds itself placed in this position—nineteen points, perhaps, out of every twenty on our railroads are wholly at the mercy of close monopolies; each twentieth point enjoys the advantages of such effects of a law of supply and demand as may be evolved out of fierce competition alternating with strict combination.

Such is the condition of affairs with which apparently the course of their investigations brought the Massachusetts commissioners face to face. The way in which they have met the difficulty is worthy of notice. They say in their report that its true competition has failed, but they argue that the failure is limited to competition between private corporations. It therefore remains to be seen if the same result would ensue were competition to be established between private and public corporations. In other words, they shift the essential element of competition—they would no longer seek it in a multiplication of competing roads in private hands, but they would find it in establishing a mixed ownership of the roads already existing. Or, stated in yet another way, they seek to break the power of combination by introducing into the system an element which will not combine. The idea of working out the problem in this way is, they acknowledge, in no respect new with them; they only seek to introduce it into America. They refer to the experience of Belgium, where such a mixed system of ownership has existed even from the beginning. In 1864, it appears that there were in that country 1,247 miles of railroad; of this amount 347 miles had been built, and had from the first been owned and operated, by the government; 117 miles more, constructed by private parties, had been leased and were operated on the same footing as the public roads; all of the remainder, 780 miles, or nearly two-thirds of the whole, were the property of private corporations, and operated solely for their benefit. In regard to the practical working of this system, they produce the testimony of one certainly most competent to judge, M. Fessiaux, the Belgian Minister of Posts, Telegraphs and Railways. In a statement submitted to the Royal Commission on Railways of 1866, this official declared "the state railways thus (through a mixed system of ownership) find themselves placed in constant comparison with the railways worked by private companies; on the one hand stimulating them to general improvements, and on the other hand acting as a sort of check against any attempt to realize extravagant profits at the cost of the public." And these results, the commissioners naturally intimate, are exactly those which they wish to see produced in Massachusetts, and which competition ought, but has hitherto lamentably failed to produce.

Though they carefully avoid all expression of opinion on the subject, it is sufficiently apparent that the Massachusetts commissioners, however it may have resulted in Belgium, have no very implicit confidence in the results of any general ownership of railroads by the State, under our system of government. They very distinctly limit themselves at present to a proposal to temper, as it were, a general rule of ownership by private corporations by a very limited infusion of public management. They therefore now propose the purchase by the State of the railroad between Boston and Fitchburg, with a view to its management, not by the government, they are careful to say, but by a board of trustees, to be selected by the Legislature from the community at large. The road, it seems, is only about fifty miles long, but it lies wholly within the jurisdiction of Massachusetts, and is so placed among the other roads of the State as to hold a commanding position—competing, in fact, in every direction. This road, the commissioners, it would seem, rather desire to convert into a standing menace upon all other corporations of the commonwealth, directly influencing them through it; creating, in fact, an inevitable competition between two systems of management, public and private, the continuation of each of which will depend on its not allowing the other to surpass it in the accommodation furnished to the public. The tenure of official life would, in fact, be simply during good behavior.

Of course it is a wholly open question whether that which has been successful in Belgium would be successful in Massachusetts. It certainly would not be successful in New York. Such a snug nest for the hungry disciples of our numerous "rings" could hardly long be kept from partisan control; soon or late, and probably very soon, it would share the fate of Central Park. Massachusetts enjoys a somewhat purer political atmosphere, and it might, by a mighty effort of ingenuity, so hedge about the direction of this road that the well-nigh ubiquitous "man inside politics" could not effect a lodgment in it. The commissioners by no means ignore the danger from this quarter, and very distinctly give it as their opinion that the whole results of the experiment depend on avoiding it. Whether it is possible to do so or not remains to be seen. If it is possible, then there is no reason why the material results which have flowed from this form of competition in Belgium should not reproduce themselves in Massachusetts. Should they do so, the effects on the industrial development of that State would be incalculable—its rate of increase would more than double. In any case, a new principle of railroad competition has been suggested, and certainly it has not been suggested before the need for it was felt.—*The Nation*.

—A bill has been introduced into the Wisconsin Legislature authorizing the Western Union Railroad Company to guarantee the bonds of the Sabula, Ackley & Dakota Railroad Company and of the other companies.

—The Commissioner of Internal Revenue reports that the tax on gross receipts of railroads in the United States amounted to \$3,732,209 in 1870. It was \$3,255,487 in 1869.



PUBLISHED EVERY SATURDAY.

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Editorial Announcements.

Correspondence.—We cordially invite the co-operation of the Railroad Public in affording us the material for a thorough and worthy Railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Inventions.—Those who wish to make their inventions known to railroad men can have them fully described in the RAILROAD GAZETTE, if not previously published, FREE OF CHARGE. They are invited to send us drawings or models and specifications. When engravings are necessary the inventor is expected to furnish his own engravings or to pay for them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Engineering and Mechanics.—Mr. M. N. Forney, Mechanical Engineer, whose office is at Room 7, No. 72 Broadway, New York, has been engaged as Associate Editor of this journal in charge of these departments. He is also authorized to act as our agent.

Removal.—About the first of February next the office of the Railroad Gazette will be removed to Nos. 110 and 112 Madison Street.

Our Prospectus and Business Notices will be found on the last page.

THE ILLINOIS LEGISLATURE AND THE RAILROADS.

We have had at least the average amount of crude railroad legislation in Illinois. The laws have been formidable in purpose and calculated, one would say on reading the text, to create a revolution in the whole business of transportation. That they have not caused serious injury to railroad companies and to the community has been only because they were utterly impracticable, so much so that no lawyer would attempt to enforce them. This, perhaps, was not to be wondered at. The subject was difficult, and very little attention had been paid to it. Members of the Illinois General Assembly are no more inspired than other men, who usually when a complex business is to be considered or treated have first to study it and understand it, and even then make many experiments before they can form a practicable plan for managing it.

But what is remarkable is, that, after all the experience of the past—valuable chiefly for warning, to be sure—after all the miserable failures of the last Legislature, and the discussions of the subject which have been quite frequent of late, there should be so very many in the present Legislature who go to work in the old blundering way, ready to repeat the legislation which has been proved to be so utterly ineffective, and which would be productive only of injury if it could be enforced. Not only this, but they apparently scorn to inform themselves upon the subject, and are ready to legislate for the minute regulation of a business

which they do not even pretend to understand. They seem not only to have learned nothing by experience, but to decline receiving any lessons.

How large this class may be will appear before the end of the session. But the debates so far indicate that it is very large, and that, therefore, the legislation this winter will be very like that of other winters in effect if not in form—if effect can be predicated of that which has no effect.

There can be no doubt, we suppose, that all corporations chartered since the adoption of the new constitution are subject to all the provisions of that constitution; but that any privileges granted to a corporation under the old constitution have been taken away from it by the new one, we do not understand. The State of Illinois has agreed with divers corporations that if they would construct and operate such and such lines of railroad, they might have such and such privileges. None of the privileges granted by this contract can be taken away by a new constitution any more than by a new law under the old constitution. They are rights in which the corporations are protected by the Constitution of the United States. There may be some controversy as to what those privileges are, but there can be no abrogation of them. So far as the old corporations are concerned, which own all but a very few miles of the railroads of the States, the Legislature has just the same power over them that previous Legislatures have had, no more and no less. It may be that the constitution directs it to pass laws which the United States Supreme Court will decide unconstitutional; but this is not power to regulate railroads, but only authority to play at such regulation.

How far railroad corporations are amenable to legislation, is a question which has never been settled in this State, and it may be that, notwithstanding the privileges secured by charter heretofore, the Legislature can provide certain restrictions on the business of transportation in the State. This is the first thing to be settled, but something which very few legislators seem to trouble themselves about. The very difficult and delicate question, "What legislation is proper?" comes next. Too often the legislator troubles himself little with either, but instead, inquires what the noisiest of his constituents would like to have, and attempts to satisfy this usually unreasonable demand by certain formal articles and sections dignified by the name of law.

Since the Legislature must provide some system of regulations for the railroads to be constructed hereafter, and these will soon be numerous and important, if not stifled by unfavorable legislation—it is important that it should have some positive information concerning railroads and railroad business. To gain this requires much time and study—more than any member of the Legislature who has any other occupation could possibly give it. Such information could only be obtained by an officer or a board of officers selected for this special service with special qualifications for it. Legislation will be worth nothing—probably very much less than nothing—unless it is planned with a knowledge of the circumstances it is intended to meet; and since it is not possible for all the legislators to obtain this knowledge personally, it is well to have some one to procure it for them. If at the present session of the Legislature nothing more is done than to provide for the collection and comparison of statistics, decided progress will be made,—much more than if an elaborate system founded on somebody's guesses should be established.

This matter, it seems to us, is of comparatively little moment to the old corporations. There is little probability that any important interference in their management can be enforced by any constitutional legislation. They will endure with the greatest equanimity legislation which will cripple new lines that might become rivals. They will not grieve very sorely even if such legislation should prevent the construction of new lines altogether. And this is what is likely to be the result of unwise legislation. If we proclaim that we will ruin any railroad that may be constructed in Illinois, we may be very sure that no railroads will be constructed here for us to ruin.

The Legislature can do more to reduce the cost of transportation by providing laws that will defend railroad stockholders in their property than in any other way. If capitalists were sure that their investments would not be lost through the rascality of their agents, or their property damaged by reckless legislation, money for the construction of railroads could be obtained easily and at low rates, and the cost of construction would be greatly reduced. It is unfortunate for our legislation that so small a part of the stock and bonds of our railroads are held in the State. There is, constantly a disposition to legislate for the patron of

the railroad and not for the owner. The consequence is that not only are laws passed unjust to the owner, but legislation which he needs to defend his unquestionable rights is never thought of.

A Double-Headed Railroad Company.

We have had heretofore a State with two governors, and now we have a similar phenomenon among corporations. The Chicago, Pekin & Southwestern Railroad Company is a corporation which within a year or so past has completed or nearly completed the grading for a railroad from Marseilles, on the Illinois River eight miles east of Ottawa, southwestward toward Pekin. It intended to complete a line from Chicago through Marseilles to Pekin, and we believe that some work has been done northeast of Marseilles.

The contract for the construction of the entire line was let to Messrs. Pierce, Clark & Sharp, a firm which has its headquarters at Marseilles. It seems that the people of Pekin, or those of them who had an interest in the company, were led to believe that the line would not be completed to Pekin, and charged that the contractors, by divers dark ways and vain tricks, were preparing to bring the management of the company pretty much under their own control. At least the stockholders were divided into two parties, which have been called the "Pekin party" and the "contractors' party."

We give herewith so much of an explanation of the transfer as we can gain from an article in the Marseilles *Citizen*, which denounces the Pekin party.

According to this article, the directors about three months ago passed a resolution forbidding any further issue of stock by the President without a special order from the Board. Notwithstanding this, the President, (Mr. B. S. Prettyman, of Pekin), did issue stock to the amount of \$804,000, dated January 4, 1871. This issue was made, it is charged, in order to give the Pekin party control of a majority of the stock at the election, which was to hold on the 10th inst. He also announced at a board meeting on the day before the election that he had let the contract for the construction of the 25 miles of the road northeast of Pekin, to the firm of Wicker, Meckling & King, annulling the contract previously let to Pierce, Clark & Sharp. This, it is claimed, he had no authority to do, and the board as soon as the announcement was made passed by a vote of 9 to 3 a resolution condemning this action and repudiating the new contract.

At the election the next day, when the issue of stock was offered an officer was ready with an injunction forbidding its acceptance. It seems then that the Pekin party withdrew and the election resulted in the choice of the following directors: Wm. B. Ogden, and J. L. Stark of Chicago; S. F. Moore, of Lisbon; E. T. Pierce and R. Clark, Marseilles; J. S. R. Overholt and J. Defenbaugh, of Reading; C. Sharp, Sr. and H. R. Kipp, of Minonk; J. W. Daugherty and Wm. A. Ross of Washington; B. H. Harris, of Groveland; W. W. Sellers, of Pekin.

These directors chose the following officers; J. L. Stark, President; C. Sharp, Sr., Vice President; Wm. B. Ogden, Treasurer; J. W. Daugherty, Secretary; A. J. Ware, Pekin, Attorney; C. W. Allendolph, Pekin, Chief Engineer.

The other party also held a meeting and elected the following directors: Joel H. Wicker, C. G. Wicker, J. S. Meckling, F. E. Hinkley, H. E. Hamilton, J. L. Stark, of Chicago; Ed. Wilcox, Minonk, Ill.; Thos. King, B. S. Prettyman, Geo. Greigg, Leander King, James Haines, and Geo. B. Foster, of Pekin. They elected officers as follows: B. S. Prettyman, President; Joel H. Wicker, Vice-President; Geo. Greigg, Treasurer, and H. P. Finnegan, Secretary.

We will not pretend to say which party is in the right or which of these two heads is alive. Doubtless the courts will have to settle the question.

Construction of a Contract as to Forwarding.

A case has recently been decided by Judge Sharswood, of the Pennsylvania Supreme Court, which deserves the attention of all who make contracts for forwarding freight. In this case the complainants shipped a quantity of oil from Pittsburgh, Pa., to Red Hook, N. J., an oil depot about thirty miles below New York, and made a contract with the Pennsylvania Railroad Company for its transportation. There was in the contract this special stipulation, limiting the carriers: "This oil is carried only on open cars, and entirely at the owner's risk from fire and leakage while in possession of the railroad company or carriers, while standing or in transit."

The Court held that this limitation applied only to the carrier with whom the contract was made, and not to

he forwarder. That if the oil had been destroyed by fire between Pittsburgh and Philadelphia, the Pennsylvania Company would not have been liable for damages, but that after it had been delivered at Philadelphia to the Camden & Amboy Company, which was to forward it by barges through the Delaware & Raritan Canal to Red Hook, that company incurred the ordinary responsibility of a common carrier. Judge Sharswood held that the Pennsylvania Company could, as the agent of the Camden & Amboy, have made a contract which would have been limited as to that company as well as to itself. But if the forwarder's responsibility is to be limited, the contract must clearly state it.

The Erie Railway.

Mr. Jay Gould, President of the Erie Railway Company, has made the following sworn statement of the earnings and expenses of that railroad for the fiscal year 1868:

Gross earnings.....	\$14,414,653 53
Expenses.....	16,519,104 82

Deficit.....\$2,104,451 30

The following are among the items of expenses:

Injuries to persons.....	\$908,000 33
Damages to freight and baggage.....	165,408 18
Damages to other property.....	9,786 79
Fuel and labor.....	1,327,452 69
Train and locomotive service.....	1,423,870 35
Oil and waste.....	140,865 25
Rents of roads.....	700,430 69
Repairs to structures.....	553,740 47
State taxes.....	246,300 46
Federal taxes.....	77,649 24
Richard Schell, for withdrawing suits.....	429,250 00
Cornelius Vanderbilt, ".....	1,000,000 00
Counsel's fees.....	329,411 30
Stenographic reporting.....	1,648 25
Printing.....	3,216 41
Expenses of Jersey City Ferry.....	131,567 85
Expenses of operating telegraph.....	99,638 28
Insurance.....	42,954 48
Hire of cars.....	118,430 16
For freight on Lake Erie steamers.....	8,464 64
Interest on mortgage bonds.....	1,398,773 00
Interest on other bonds.....	411,754 65
Interest on notes for expenses.....	263,751 88
Superintendence, office expenses and contingencies.....	32,263 53
Office expenses and stationery.....	197,769 10
Agents and clerks.....	785,185 66
Labor, loading and unloading.....	49,018 67
Porters, watchmen and switchmen.....	168,892 56
Wood and water station attendance.....	15,753 84
General superintendence.....	111,530 32
Contingencies.....	15,463 16
Repairs of track and roadway.....	2,754,652 64
Repairs of rolling stock.....	2,918,053 40

Eureka.

The *Scientific American* publishes an engraving and description of an "Anti-Snoring Device," the invention of M. T. Pinchard, of New Orleans, to which we would most earnestly call the attention of the proprietors and conductors of sleeping cars. The philosophy of the invention is that snoring is caused by sleeping with the mouth open; therefore, if it could be closed, and the dropping of the lower jaw prevented, silence would reign supreme.

The contrivance consists of a band which passes over the top of the head and under the chin, and is drawn tight with a buckle. It is held in position by suitable attachments.

The amount of torture inflicted by obese people with easy consciences and huge digestion on nervous travelers in sleeping cars, can only be realized by the latter. This invention offers to them the first dawn of hope for relief from this misery. A law ought speedily be enacted authorizing every railroad conductor and porter to fasten one of these attachments on every passenger caught in the act of disturbing the peace and slumbers of weary humanity. We can imagine the fervor of vindictive joy produced by contemplating the seizure of some luxurious wretch who has made night hideous with his sonorous trumpeting and seeing him bound with what Mr. Pinchard calls the "Sanitary Brace." How sweet, too, would be the slumber after such an exhibition of vindicated justice. By all means, let us have the new invention introduced into sleeping cars, and oblige all hotel-keepers to supply their guests with them on demand.

A Superintendents' Association.

The New England Railroad Superintendents' Association, which was first organized about twenty years ago, and then collected a considerable library and a cabinet of models, and held meetings for the discussion of questions of management and operation, was revived and reorganized on the 15th of December, ult., when about thirty superintendents met in the library room of the Boston & Albany Railroad, in Boston, and chose the following officers: President, C. O. Russell, Boston & Albany Railroad; Vice-President, Gyles Merrill, Vermont Central; Treasurer, Francis Chase, Portland, Saco & Portsmouth; Secretary, William D. Hilton, Providence & Worcester.

If the future meetings are well attended, and the discussions are free and full, great benefits should result therefrom.

Among the Railroad Shops.

THE CHICAGO & ALTON SHOPS IN BLOOMINGTON.

Several weeks ago we made a visit to Bloomington, and examined the shops of the Chicago & Alton Railroad. At the time we made copious notes, but since, our columns and our time have been so much filled with matter which required prompt attention, that we have been unable to tell our readers what we saw and heard there.

The journey from Chicago was made in one of the new day cars which this company has built for its line. As we are having illustrations made of these cars, we will postpone our description of them until the engravings appear.

The shops at Bloomington, it will be remembered, were almost entirely destroyed by fire in 1867. Since that time the company have reconstructed the buildings, and, to a great extent, supplied them with new machinery. The new buildings which have been erected are:

1. Storehouse and offices..... 60x120 feet.
2. Blacksmith shop..... 100x30 feet.
3. Car shop..... 80x363 feet.
4. Paint shop..... 75x176 feet.
5. Car machine shop..... 75x370 feet.
6. Foundry..... 60x180 feet.
7. Round house..... 240 feet diameter.

They are all constructed in the most substantial manner, with iron roof trusses covered with slate. There was but one defect which attracted our attention, which was a deficiency of light. A building intended for a workshop can never have too much daylight in it. The whole of the wall surface not required for the support of the building should be glazed. This is beginning to be recognized by some manufacturers, as, for example, in the watch factory at Marion, N. J., which is built of iron. The whole of each of the four sides, with the exception of the space occupied by the iron columns, which are necessary to support the building, is a wall of glass. There will always be dark or short days when it will be difficult to see with all the light that can be let into a workshop, and, of course, it will not be easy to err in having too much light. It may, therefore, be assumed that in constructing buildings of this kind, that the walls should be gathered into pilasters, to support the superstructure, and the intervening space should be filled by the windows. Besides the windows in the sides, if the building covers a large area, there should also be good skylights in the roof. These will furnish light in the center of the building, where it will be needed at times, even with the best side lights. All the facilities and comforts which can be given to workmen will be amply paid for by the additional amount of service rendered. However, it was not our purpose to find fault, but the occasion has given a good opportunity of saying what was in our minds long before we visited the Bloomington shops.

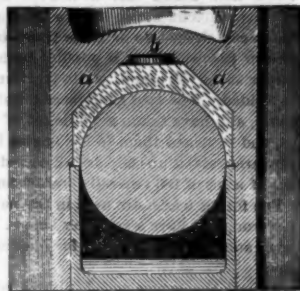
The building, which is occupied below by the store room, is two stories high. A broad hall extends the whole length of the upper floor, and on each side of it are the offices for the different operating and mechanical departments of the road. The first is occupied by the Assistant Superintendent and Train Master, adjoining which is the office of the Superintendent of the Telegraph. Six instruments are in use in this room, manufactured at Ottawa, Ill. The battery room is located below the ground floor, with stone flagging pavement. A Grove battery of fifty cups is used to supply one end of each of the three divisions of the road. Opposite to the office described is that of Mr. Jackman, the Superintendent of Machinery. Next to his office is the drawing room. On this same floor there is also a conductors' room, used by the conductors when off of duty, Mr. Reniff's office and drawing room, the office of the Chief Engineer, Road Master and Train Master's clerk. Having so many of the different offices and departments of the road so near each other, of course facilitates the transaction of business and enables the different officers to have a better understanding of the relations of one to the other.

The whole of the lower story of the building we have been describing is occupied by the store room. This does not differ very materially from any other store room, except in being much better arranged than usual, and having greater facilities for storing all kinds of goods and material used on the line. It would surprise many people to examine the great variety of supplies which are needed on a railroad. Not only are there a great many kinds of material used, but there are often half a dozen different patterns of the parts of machinery which are used for the same purpose. Until railroad companies realize the evil of this more fully and make a combined effort for the adoption of some system of duplicate parts, we suppose no general uniformity will be possible. The fault is not usually with the master mechanics nor those in authority, but is the result of the system, or rather want of one, which has been drifted into during these past years.

It is the intention of the Chicago & Alton Railroad Company to build a new machine shop, in addition to the new buildings which we have enumerated. At present, all the work is done in the old building, which, we believe, was not destroyed by the fire, when the other buildings were burned. The conveniences in this shop are hardly up to the requirements of the road, but its deficiencies will be remedied as soon as the new shop is built. Notwithstanding the rather limited capacity of the building, however, a very casual observation shows that the work is all done very systematically. Mr. Jackman, and Mr. Smith, his foreman, evidently understand how to do very good work with insufficient accommodations, like the man who boasted that he got a great deal of very good sleep out of a very poor bed.

In several previous numbers we have had something to say about driving boxes. The brasses which Mr. Jackman uses, of which we give a cut below, are made octagonal, but are fitted into the housing so that the top does not bear against

the cast iron, but has a clearance of about 1-32 in. As it wears, the weight of the engine pressing against the inclined sides *a, a*, it is claimed, has a tendency to keep the brass tight; *b* is a round boss let into a recess bored into the housing, and is intended to hold the brass in position laterally.



Adjoining the machine shop is a very carefully kept tool room, in which the drills, taps, dies, reamers, etc., are kept and repaired. When any of them are taken out they are charged to the person who has taken them, and credited to him when returned. In a description of the Rock Island Railroad Shops, we made some remarks on what we considered the defects of this system, in that it did not give the workman any evidence to show that he had returned a tool, after he had done so. Since that time, in the shops of the Cleveland, Columbus, Cincinnati & Indianapolis Railroad, we have seen a system of checks in use, which seems to meet the difficulty. Each man who uses the tools has three checks. If, for example, he takes out a $\frac{1}{2}$ -in. tap, he gives the keeper of the tool-room one of his checks, which is deposited in the pigeon-hole or on the shelf where the tap of that size is kept. The check, which is the evidence that he took out the tap, is given back to him when the tool is returned. There is, therefore, not so much room for error as there is when both the charges and receipts are made by one person. There is one more advantage about it. If another man should want to use the $\frac{1}{2}$ -in. tap before the first one had returned it, then the second one would get the tap from the first, and give him his check. Number one then takes number two's check to the tool-room, and exchanges it for his own. The tap is then charged against number two, who has it, while number one has thus received back his own check. At the Cleveland shop metallic checks are used, but a simple card, with the signature of the man, and a space in which the tool used could be described, would serve as well or better.

But, to return to the Bloomington shops. Mr. Jackman is getting out the work for two new locomotives, which he expects to build during the winter and spring. The boilers, which he has built, are all made with covering plates, or "welts," inside the longitudinal seams. There is a single row of rivets through the three thicknesses of metal at the lap. The rivets are $\frac{1}{2}$ -in. in diameter, spaced $1\frac{1}{2}$ in. from center to center. On each side of this row and about 4 in. from it are two more rows of rivets spaced $3\frac{1}{2}$ in. from center to center. They pass through two thicknesses of metal, i. e., the covering plate and shell of boiler. The plate is bent or set so as to conform to the lap which it covers. This makes a very strong seam, and perhaps next to a butt joint with double covering plate is the best in use.

We observed in the boiler shop here that the sides of the tanks were braced and strengthened with $5 \times 3\frac{1}{2}$ in. T iron, which is lighter than L iron. We also noticed in the boiler shop a very compact portable forge with one of Roost's small blowers. The latter receives its motion from a belt and pulley which are driven by a hand crank.

The greatest novelty in these shops is a machine for clearing the scale off of flues, which is the invention of Mr. Smith, the foreman. It is difficult to explain it clearly without a drawing. The flues are passed between two grooved rollers, by which the scale is crushed. Beyond these rollers are revolving steel scrapers, held in a sort of head, somewhat resembling the head of a bolt-cutter. The scale which has been broken and crushed by the rollers is scraped off by this contrivance. The machine has another set of rollers behind the revolving head which keeps the tube in line with the axis of motion of the scrapers. The latter are 3 in. wide and $\frac{1}{2}$ in. thick, and are located tangentially to the flue, and are pressed against it by steel springs. Both the rollers and the scrapers are made sufficiently yielding by rubber seats on which they rest. The seat for the rollers is formed by a sort of rubber thimble placed between the roller and its shaft. This machine cleaned four flues in five minutes while we were looking at it. Any common laborer or boy can attend it.

The new blacksmith shop which has just been built is probably the best in the Northwest. Each forge is cemented to a chimney, and besides ample height has been given to the roof to carry off the smoke which escapes from the forges. Two new steam hammers with 1,500 lb. rams were being erected when we were in the shop. One of them was built by Bement and the other by Sellers. If Mr. Jackman were to put up one more of the same size built by Ferris & Miles there would be an opportunity of testing the relative merits of the hammers made by each of the three principal builders of these machines.

Speaking of hammers, recalls a very neat little machine for piecing flues. An ordinary locomotive tube has so little metal in it that it will hold a welding heat but a very short time. It is therefore very difficult for a blacksmith, no matter how expert he may be, to strike fast enough to effect a perfect weld before the metal becomes cooled below the point where it will unite. Mr. Hughes, the foreman, having experienced this difficulty designed a trip hammer to be worked by hand. The hammer head and anvil each have a half-round die which conforms to the shape of the tube. The hammer helve is operated by a ratchet wheel with

six teeth, and the hammer is brought down quickly by a steel spring. The shaft of the ratchet wheel and crank has a heavy fly-wheel to overcome the intermittent motion of the ratchet. With this machine a man can strike two or three times as fast, and with much greater precision than is possible by hand. The blacksmith's helper turns the crank, while the former handles the tube to be welded. The two have pieced out 150 2-in. tubes in ten hours, and have taken a whole set of flues out, pieced them up, and returned them to the engine in the same day. After they are welded up they are all tested by a hydraulic pump. Out of a set of 136 two only were found to be imperfect.

The forges which are used in the new shop are all made of cast iron, and have a coal box below. They all have a water tuyer and a very neat valve for opening and closing the air pipe.

Not all the forges which will be required have yet been put up, and considerable work which will be necessary to complete the blacksmith shop is still undone.

A furnace for heating the iron for the truck frames, has been put up in a separate building for that purpose. Suitable formers for bending the iron are located in a convenient position. The sides of the building are left open so that the heat from the furnace can escape easily. The iron roof of this building is one of the neatest we ever have seen. It is only 26 feet span, but was evidently designed by some one who had great skill, and experience. It looks as though the building were intended for a play house for very young engines.

The new foundry which has been built is not yet occupied. In the old building 20 car wheels, and about 6 tons of other castings are made per day. The new foundry will have every facility for doing work. It has two cupolas 50 in. in diameter inside which are supplied by air from a No. 9 Sturtevant blower. The main building, which is 60x180 ft., has an L attached which is to be used as a cleaning room.

The car department is under the management of Mr. R. Reniff. About 230 men are employed in it. He is just completing the last of ten new passenger cars for their road. We are having engravings of these cars made, and will postpone our description until they appear. They all have President Blackstone's coupling arrangement and Reniff & Buttolph's summer ventilating apparatus, all of which we will describe when our engravings of the car are finished. It is the intention of the authorities of this road to have two freight cars per day built during the winter. We were shown a very ingenious signal, which is the invention of one of the men employed in the car shop, whose name has escaped our recollection. It is arranged so as to display either a flag or light and is under the control of the telegraph operator. We hope to give a cut of this at some future time. It would be impossible to describe it so that the description could be understood without an illustration.

Before leaving the shops Mr. Jackson took us into his sand drying house. The drying is effected simply by a large egg-shaped stove with a hopper around and over it. At the bottom of the hopper are a number of 3/4-in. round holes. As long as the sand is moist it will not run out of these holes, but as soon as it gets thoroughly dried it begins to trickle out until the hopper is emptied and is ready for another charge. A reliable son of Hibernia is all the attention the institution requires.

We will have more to say of the work of the car department in a future number.

ILLINOIS RAILROAD LEGISLATION.

We give below a summary of the legislation affecting railroads which has been introduced at the current session of the General Assembly:

It is reported that both the House and Senate Committees on Railroads in the Illinois General Assembly were in great part selected by Hon. A. C. Fuller, the Chairman of the Senate Committee, who was very active in urging restrictive legislation two years ago, when he was in the lower house. Mr. Fuller is a man of more ability than is usually found in a State legislature. He was Adjutant-General of the State during the war, and developed unmistakable executive ability in that position. He has been also a prominent candidate for nomination to Congress from the Second District, and at one time came near a nomination as Governor of the State. The railroad legislation he has proposed heretofore we cannot say much for, but very much against, but his influence, his energy and persistence are such that he is very likely to secure the passage of the bills he proposes.

FREE PASSES AND EXPRESS CHARGES.

Senator Epler, on the 16th, introduced a resolution prohibiting the issue of free passes by railroad companies; also another requesting the Committee on Railroads and Warehouses to report a bill for regulating the charges of all common carriers, intended especially to hit express companies, we suppose.

In the House a bill has been proposed directing express companies to adopt uniform rates of charges throughout the State, and another directing the railroad companies to adopt a uniform code of signals.

RIGHT TO CONSTRUCT SIDE TRACKS AND SUPPLY CARS. Mr. Chandler, of Vermillion County, has introduced into the lower house the following resolutions:

Resolved, That the railroad companies of this state shall permit the owners of warehouses, coal yards, coal mines and

lumber yards to construct and connect branch or side tracks with their roads, and that they shall afford the same facilities for the transport of freight to and from their side tracks as to other roads, and whenever said railroad companies shall fail to provide cars sufficient for transporting freight to and from said side tracks, the owners of the same may furnish cars sufficient for their own traffic, for which said railroad companies shall pay the same sum for car service on their respective roads.

MAXIMUM FARES.

The following is a copy of Senate bill No. 6, entitled, "A bill for an act to establish a reasonable maximum rate of charges for the transportation of passengers on the different railroads in the State," which was introduced by Hon. A. C. Fuller, of Belvidere.

SECTION 1. Be it enacted by the People of the State of Illinois, represented in the General Assembly, That all railroad corporations organized and doing business in this State, under any act of incorporation or general law of this State, now in force or which may hereafter be enacted by the General Assembly of this State, shall be and are hereby limited to such rates or charges for the conveyance of passengers in this State, as are hereinafter prescribed, or which may be hereafter prescribed by law.

SEC. 2. No such railroad corporation shall, after the first day of July next, charge or receive for the conveyance of any person (with his or her ordinary baggage, not exceeding 100 pounds in weight) over its road, or any portion thereof, a greater sum than three cents per mile, nor for any person under twelve years of age, more than one-half that sum per mile; nor shall any other corporation, person or persons, use or operate any railroad now constructed, or which may be hereafter constructed in this State, and charge for the conveyance of passengers over such road a greater sum than is prescribed for such conveyance in this act.

SEC. 3. Any railroad corporation which shall collect or receive any greater sum for the transportation of any person than is authorized by this act, shall be liable to the party aggrieved in five times the excess so collected or received. And the same may be recovered, together with costs and a reasonable attorney's fee, to be taxed by the court, upon the trial, in an action in any court of competent jurisdiction. And any officer, agent or employee of any of the aforesaid corporations, person or persons, who shall knowingly and willfully collect or receive for the transportation of any person on any railroad in this State any greater sum than is authorized in this act shall be deemed guilty of a misdemeanor, and shall be liable to an indictment in any court of competent jurisdiction, and, on conviction thereof, shall be punished for each offense by a fine of not less than one hundred dollars, nor more than five hundred dollars, or by imprisonment for not less than thirty days, nor more than one year, or both, in the discretion of the court before which such conviction shall be had.

SEC. 4. Any willful violation of any of the foregoing provisions of this act, on the part of any railroad corporation, shall be deemed and taken a forfeiture of its franchises. And any such corporation so offending may be proceeded against by the State's Attorney in any circuit or county through or into which its road may run, upon information, in the nature of a *quo warranto*, to judgment of ouster and final execution.

SEC. 5. The term "railroad corporation," in this act, shall be deemed and taken to mean all corporations, companies, associations or individuals, now owning or operating, or which shall hereafter own or operate any railroad in this State: Provided, the provisions of this act shall not apply to horse railroads.

DEBATE ON THE FULLER BILL.

On Tuesday last Mr. Fuller's bill, unanimously introduced by the committee, came up in the Senate for discussion. The following summary of the debate we condense from the Chicago Tribune's report:

Senator Nicholson offered an amendment fixing the penalty for violation of the law by any officer of the road at not less than \$20 nor more than \$30, instead of a fine of not less than \$100 or more than \$5,000, or imprisonment, or both, as provided by the bill.

Senator Fuller considered the penalty essential to the effectiveness of the bill. He said the third section had been the subject of much criticism. It had been considered with great care, and he did not think it obscure. The agent, acting under orders of the corporation, was made responsible by punishment as an individual, and yet the company was not relieved of damages. The rest of the section was to punish all who violated laws. It applies to conductors and to all others, and cut them off from pleading that they were simply obeying orders. We forbade them to execute illegal orders. The railroad companies could stand the little fines of the amendment a long time, and perhaps make money. The Legislature should make it unprofitable for railroads and their agents to violate the law. Legislation was specially needed. The constitution had imposed upon them the necessity of taking action on the subject. The demand of the people was urgent, and they were compelled to meet it. Whether the law they passed was reasonable or unreasonable, the corporations must obey until the higher Federal Courts said it was illegal. That was the moral of the bill. This measure was liberal. The rate was a compromise, and a liberal one. But whatever it was unless stringent provisions were put in the bill, it was not worth the paper it was written upon.

Senator Epler said that the amendment did not call for a discussion of the expediency of the law, or what the constitution had directed. He was not bound to vote for a bill with obnoxious features, because the subject was mentioned in the constitution. Bills might be brought up to carry out measures required by the constitution, which would be offensive to all. Let them make their legislation practicable and sensible, and not merely get up a bare theory. Mr. Fuller must feel the difficulties surrounding the subject. He had prepared a freight bill which was thought just. This law had stood a monument of the labor and the folly of an Illinois Legislature. It was burdened with penalties which would have bankrupted every railroad employee, deprived every railroad of its franchises, and sent one-half of those connected with it to the Penitentiary; and yet that bill had never been attempted to be enforced. It had not elicited a law-suit, and started no informer. It had been violated, wherever a railroad ran, with perfect impunity. Every road had made rates, which was a thing forbidden. With no ill-will to the present bill, he did not think that it should be passed, at least without many amendments. There were things proposed which required careful and candid consideration. The amendment of Senator Nicholson was sensible and just. The old theory of outrageous punishments was at an end. The penalty should be graduated by the crime, and they should not punish vindictively every railroad employee. The penalty in the bill was outrageous, enormous, and inconsistent. He could not vote for the bill as it was. No jury would find an agent guilty, and that provision would be a dead letter.

Senator Alexander also favored the amendment, but it was finally withdrawn.

Sensors Hunter and Dore wished for caution rather than haste, and would not commit themselves in favor of the bill.

Senator Boyd saw no importance in the law regulating passenger rates, as they had not been extravagant, or had not been greatly complained of. The rate in the bill might be correct, but the value of a law depended not on the penalty, but the certainty of execution. The weakness of the law was that no one was provided to see that it was carried out. In many respects the law of 1869 was excellent, but it was not enforced, since the penalties were such no person would take the risk of enforcing them against a corporation. Let the penalties be large, and not nominal, like those in the amendment, and then appoint some one to see that the law was carried out. Let them begin properly on this question, and then, when they came to the great question of freight, let them deal with that as it deserved, by passing proper legislation, and then providing means to see that it was enforced.

Senator Fuller said that the law of 1869 proceeded on the theory that the forum was the courts—that they were to decide as to the reasonableness of charges. Its friends did not dare to encumber it with the provision for the appointment of officers to see that it was enforced. Under that law, weak as it was, railroads did revise, reduce, and equalize charges, and break up discriminations against local freights. Now, the constitution said the Legislature, and not the courts, must fix the rates. That simplified it. There should be officers appointed, and he had prepared a bill for the creation of officers, or the appointment of a tribunal, to go out and make a full examination, and report what changes were proper to be made, and then, when they had information, they could make a proper law. Now, keeping free from mixing passengers and freight, and creating a tribunal to decide on both, would meet the views of Senator Boyd. The present bill was peculiarly simple. It required no such previous examination. Let them pass it, and that out of the way, take up the question of freight, which was occupying more ability than any other. He fully confessed he had not to his entire satisfaction founded the entire question of freight, and he was not yet able to classify all articles of freight. The best men in the State should be employed, and they should have all the information before they came to a decision. They would try to temporarily reach the question of freights by fixing maximum and minimum rates, and then sending out a commission to get all the necessary information. The first part of the third section provided for the pecuniary mulcting of the companies, and the latter for the punishment of the agents.

Senator Nicholson offered an amendment excepting from a portion of the bill roads with 3 ft. 6 in. gauge or less which may be constructed hereafter. This amendment was lost.

Senator Starne offered an amendment dividing all roads into three classes, to be known as first, second, and third. All roads whose gross earnings are \$8,000 per mile belong to the first class, and can only charge 3 cents per mile; all whose gross earnings are \$6,000 per mile belong to the second class, and can charge 4 cents; and all others form the third class, and can charge 5 cents. Mr. Starne thought it was a gross injustice to allow the same price to all. The Northwestern made \$12,000, Rock Island \$10,000, and Illinois Central over \$8,000, while those in the southern part of the State made hardly anything. Pass the bill and they would kill these new enterprises, which were to-day trying to sell their bonds, but which could not do it if this bill was passed, and the matter carried to the courts. The railroads had made Illinois. They had been built by money from abroad. Chicago was built up in that way, by railroads, and they should be careful how they touched that great enterprise.

Senator Strevel, while he would have maximum rates fixed, believed that some of the weaker lines could not afford to carry at the rate provided for in the bill.

Senator Fuller said the only way to make a classification was to learn the circumstance of each road, learn the proper rate, and then specially name it in the law. The road that earned the most per mile did not have the greatest net earnings. The narrow gauge roads would not be overlooked in other bills. Supposing they tried to scale the roads, it would result in a labor which few men knew of. They would have to learn the expenses of the road, its construction and equipment account, and other things which would have to be extorted from its officers. They could make no satisfactory scale, and hence they had, rather than have no legislation, adopted a rate that would be pretty generally satisfactory, when tried.

The opinion of members ran from two cents to five. Had he his own way he would put it down to two for five roads, and put it higher for others, but if they went into that question they would never get through. There was no desire to crush railroads. That gentleman did not consider the amount of thirty millions paid to roads as a transportation tax. A great part of the railroad stock, forming the basis on which tariffs were imposed, was watered. His section of the country had more projected roads than many others. He was not warring against railroads, but he thought three cents enough on the whole.

Senator Starne offered another proposition, giving a road so many years after it was completed before it came under the operation of the law. Gross earnings did indicate net earnings, though perhaps not to the stockholders. There were very few roads in Illinois whose net earnings were not 40 per cent. He did not provide for watered stock, but the actual cost of the road. He was not prepared to act, and none of them were. If the bill were to pass, and go to New York, it would stop the sale of all first mortgage bonds. It would go to the courts, and, judging of the future by the past, it would be long before a decision was obtained from the Federal courts. They could get no decision in a year, when contending with powerful railroads. The experience in Ohio had shown that not one road had been built since the Legislature regulated rates.

Senator Richardson moved to postpone the consideration of the bill until Thursday of next week, but his motion was defeated by a vote of 42 to 4, and the bill was made the special order for Thursday.

Senator Underwood gave notice of his intention, at the proper time, to offer a substitute for the whole bill, providing for the appointment, by the Governor, of three railroad commissioners, subject to the approval of the Senate, to hold office for one, two, and three years, and their successors for three years. It is made the duty of all railroad corporations to report, whenever requested by the commissioners, all information required by the constitution, and also the expense of the construction of the road, and appurtenances, necessary expenses of operating since its construction, its actual value, their rates for way and through passengers, and freight, etc. The commissioners are required to take into consideration the cost and expense of constructing and operating the road, its business, losses and profits, and other facts necessary to reach a just, equitable, and fair conclusion, and then determine what shall be reasonable and fair rates for passengers and freight, and furnish to the officers a list of the same. In case any road is dissatisfied with the rates, it may, within twenty days, file a petition stating its grounds for complaint, the cause to be docketed on the People's Docket, in the name of the People of the State of Illinois, and shall be tried by jury as soon as possible. In case no petition is filed, or a verdict is found against the defendant, and the charges are not reduced, the road shall be liable to a penalty of \$1,000, and forfeit its charter; and the commissioners are required to begin

proceedings by *ex parte*. Any road failing to maintain a public office in this State, as required by the constitution, is made subject to indictment, and fine not exceeding \$1,000.

On Wednesday the debate was continued with considerable vehemence, and considerable opposition was developed from members of ability and influence. Mr. Starne's amendment was voted down by a vote of 11 to 35. Senator Strevel expressed the opinion that the bill was unconstitutional. Senator Marsh, of DeKalb (probably having the DeKalb & Sycamore "plug" in mind), wished to exempt roads less than ten miles long, but in vain.

Senator Washburn offered an amendment by inserting in the second section, after the word "corporation," the words, "nor any officer, agent or employee thereof." The amendment was agreed to.

Senator Beveridge offered a substitute for Section 2, by which, substantially, through lines would form the first class, their branches, and roads wholly within the State, connecting at both termini with railroads of the first class, would form the second class, and roads with no connections, or with a connection at only one terminus, and not owned or operated in connection with a road of the first class, would form the third class, and the rates would be fixed for each class. The bill was then committed, together with this amendment, to the committee.

We understand that the committee will report the bill pure and simple, and against the amendment. Also, that a very large majority of the Senate, perhaps three-fourths, is likely to vote for the bill. Its fate in the House is quite uncertain.

In the House, on Thursday, Mr. Roe offered a bill to regulate railroad freight rates, providing that the price for carrying a hundred pounds the first mile shall be fixed, and the price for carrying any distance beyond one mile shall not exceed one-tenth of the rate for one mile.

RAILROADS IN MISSOURI.

A correspondent at Jefferson City, Mo., sends us the following compilation from official sources of the railroad statistics of Missouri, showing the total number of miles built, and the length completed and in course of construction January 1, 1871:

	No. of miles built from Jan. 1, 1870 to Jan. 1, 1871.	No. of miles completed on Jan. 1, 1871.	No. of miles in course of construction Jan. 1, 1871.	
Pacific (of Missouri).....	355	114	241	Including leased roads.
South Pacific.....	131	279 1/2	25	
St. Louis & Iron M'n.....	211	92	22	miles ready for iron.
North Missouri.....	361			
Mo., Kansas & Texas.....	105			
Hannibal & St. Jo.....	216			
Kansas City, St. Jo. & Council Bluffs.....	10	208	53	St. Jo., C. B. and Mo. Valley consolidation.
St. Louis & Ft. Scott.....	38	38	80	
Laclede & Fort Scott.....				
St. Louis & Santa Fe.....				
Osage Valley & Southern Kansas.....		25 1/2	60	24 miles graded.
St. Louis & Keokuk.....			19	
Louisiana & Missouri River.....	3	3	301	To be completed to Jefferson City by May 1, 1871.
Chicago & Southwestern.....	50	60	100	
Alexandria & Nebraska City.....			75	40 miles ready for iron.
Kansas City & Cameron.....			53	Operated by Hannibal & St. Joseph R. R.
Boone Co. & Jefferson City.....			22	Operated by North Missouri Railroad.
St. Louis, Chillicothe & Omaha.....	40	40	25	
Lexington & St. Louis.....	34 1/2	78	53	Graded.
St. Louis, St. Jo. & Lake.....			106	24 miles ready for iron.
Cape Girardeau & State Line.....			17	
Missouri & Mississippi.....			160	60 miles ready for iron.
Totals.....	417 1/2	3,055	1,182	

—In a recent case decided by the Philadelphia Court of Common Pleas, the following points were decided:

1. A railroad company constructing their road in a tunnel or archway under a public street, do not impair their right to the exclusive use of the ground over the tunnel.
2. Any person erecting a building or otherwise attempting to take possession of such ground, is a trespasser.
3. There is no valid right to such occupancy, either in the owners of adjoining lands, or the city, as against the railroad company.

Suspension Bridge & Erie Junction.

The Supreme Court at Rochester gave a decision, on Friday of last week, confirming the report of the commissioners in the Suspension Bridge & Erie injunction case, permitting the Erie Company to complete the new line from Buffalo to Niagara. On Saturday night the New York Central ran engines off the tracks at the intersections to prevent the Erie laying necessary rails and frogs. The Erie's working parties went in force Sunday, and removed the obstructions, and operated under the instructions to complete the line during the night.

Chicago Railroad News.

Chicago & Northwestern.

The Treasurer of this company, Mr. A. L. Pritchard, has issued from the New York office the following statement in detail of the earnings and expenses for the first six months of the fiscal year, from June 1, to November 30:

EARNINGS.	
From passengers.....	\$1,915,396 59
From freight.....	4,821,106 90
From express.....	122,566 65
From mails.....	91,776 48
From miscellaneous.....	54,383 38
Total.....	\$7,004,774 00

EXPENSES.

The operating expenses and taxes were as follows:

Operating expenses (48 46-100 per cent.).....	\$3,429,669 64
Taxes.....	35,140 81

Total expenses (48 46-100)..... \$3,464,809 95

The other current charges were:

Interest on bonds.....	\$337,105 00
Interest and exchange.....	6,189 43
Sinking funds.....	45,120 00
Rent of Iowa roads.....	539,288 18
Chicago & Milwaukee Railroad Company dividends.....	718 20

Total charges for six months..... \$4,590,230 36

Leaving net earnings for six months, in excess of operating expenses, taxes, interest on bonds, rents, sinking funds, etc..... \$2,414,543 64

INCOME ACCOUNT.

Balance to credit of income account, May 31, 1870.....	\$541,494 29
Net earnings, as above, for six months, to Nov. 30, 1870.....	2,414,543 64
Total on Nov. 30, 1870.....	\$2,956,037 93

Deduct five per cent. dividend (free of tax) on common and preferred stock, for six months ending Nov. 30, 1870..... 1,750,940 00

Balance to credit of income account Nov. 30, 1870..... \$1,205,097 93

Comparative statement of operating expenses for the six months ending Nov. 30th, 1869 and 1870:

OPERATING EXPENSES (cents omitted.)

	6 months end. Nov. 30, 1869.	6 months end. Nov. 30, 1870.	Decrease and Increase.
Repairs of engines and tenders.....	\$394,582	\$254,371	Dec. 140,211
Repairs of cars.....	492,045	343,365	Dec. 148,680
Repairs of buildings.....	104,615	60,332	Dec. 44,283
Repairs of fences, gates and cross-gs.....	97,362	45,157	Dec. 52,205
Repairs of bridges and culverts.....	163,655	115,539	Dec. 48,116
Repairs of track.....	947,154	836,793	Dec. 110,361
Repairs of tools and machinery.....	91,615	57,513	Dec. 34,102
Fuel used by locomotives.....	536,817	358,778	Dec. 178,039
Fuel and lights used on cars and at stations.....	49,813	37,396	Dec. 12,416
Oil and waste used.....	67,116	56,231	Dec. 10,885
Office and station furniture and expenses.....	30,259	28,938	Dec. 1,321
Furniture and fixtures for cars.....	9,649	6,623	Dec. 3,026
Foreign agents.....	21,617	22,736	Inc. 1,119
Advertising.....	11,161	5,918	Dec. 5,243
Stationery, printed blanks, tickets, etc.....	29,211	29,029	Dec. 182
Engine men, firemen and wipers.....	289,290	282,556	Dec. 6,733
Conductors, baggage men & brakemen.....	194,206	192,699	Dec. 1,507
Laborers and switchmen at stations.....	348,276	313,134	Dec. 35,142
Agents and clerks at stations.....	253,914	227,509	Dec. 26,405
Superintendence.....	40,662	36,435	Dec. 4,227
Rent.....	17,587	21,737	Inc. 4,150
Loss and damage.....	34,232	31,305	Dec. 2,927
Injury to persons.....	16,216	11,741	Dec. 4,475
Teaming freight, baggage & mails.....	5,300	4,759	Dec. 540
Insurance.....	22,721	18,880	Dec. 3,841
Cleaning snow and ice.....	6,827		Dec. 6,827
Miscellaneous expenses.....	48,870	31,327	Dec. 17,543
Total.....	\$4,235,295	\$3,429,669	Dec. \$805,626

Add for state and county taxes..... 3,606
Add for U. S. tax on passenger cars..... 54,551
Add for U. S. rev. tax stamps..... 2,224

Total..... \$4,305,677 \$3,464,809 Dec. \$840,867

Decrease in operating expenses and taxes for the six months ending November 30, 1870, as compared with the six months ending November 30, 1869, \$840,867, or 19.34-100 per cent.

Decrease in interest on bonds, rent of leased roads, etc., \$109,879.52, or 9.15-100 per cent. Total decrease in all charges for six months, \$940,747.15.

EARNINGS.

	1869.	1870.	Dec.
From passengers.....	\$2,177,580	\$1,915,396	Dec. \$262,184
" freight.....	4,804,483	4,821,106	Inc. 16,623
" express.....	126,742	122,566	Dec. 4,176
" mail.....	84,124	91,776	Inc. 7,652
" misc. sources.....	61,979	54,383	Dec. 7,596

Total..... \$7,264,879 \$7,004,774 Dec. \$260,105

Total decrease of earnings for the six months ending November 30, 1870, as compared with the six months ending November 30, 1869, \$260,105.24, or 3.57-100 per cent.

Thus we have for the busiest half of the year aggregate earnings amounting to \$7,004,774, and operating expenses to \$3,464,809, or 49.4 per cent. of the earnings, which has not often been equaled in American railroads. It is true that the coming taxes must be paid during the current half year, and that it will not be easy to make the decrease in expenses the equal in amount, though it may be in percentage, in this half of the year when the earnings are lighter. But if the proportion is maintained the saving in expenses during the year will amount to the astonishing sum of \$1,000,000, so that with a decrease of perhaps \$450,000, the profit may be greater by \$1,150,000 than during the previous year.

The company's business has been seriously interrupted during the week by the great snow storm of Saturday and Sunday. The Freeport and Fulton lines were not entirely cleared until Tuesday night, and an enormous amount of hard work was necessary to effect this. The storm was more severe on its line than anywhere else in the country, so far as we can learn.

Lake Shore & Michigan Southern.

The snow storm of the past week caused comparatively little hindrance to the movement of trains. All trains on

Monday arrived, though some of them about three hours behind time; the difficulty being principally between this city and Englewood. At many points on the lines the telegraph wires and poles were broken down by the accumulation of ice, and up to Thursday were not entirely repaired.

Chicago, Rock Island & Pacific.

The Pacific Express, which left this city last Sunday was unable to get through on account of the snow. Near Rock Island and between Englewood and this city the road was badly blocked up, not, however, so as to prevent the passage of the Monday trains.

Chicago, Burlington & Quincy.

The Fox River Valley road, which was to be opened by this company last Monday, at that time was snowed under. The track was cleared after the middle of the week, and trains are now running.

The snow storm gave a great deal of work on the line, and interrupted business somewhat. Two hundred miles were cleared on Sunday, and trains got through Monday.

The Postmaster-General has made arrangements with the company by which a mail will be received on Sundays, between Chicago and Omaha, each way, connecting with the trains on the Pacific Railroad, which run every day. For want of this arrangement, heretofore, the mail was received at San Francisco, from the East, for three days each week, and none the corresponding week day in the Pacific States and Territories, and no mail was received at the East one day each week.

The company has ordered fifteen new locomotives from the Manchester Locomotive Works. These will be needed directly on the new lines recently acquired.

Heroism of a Railroad Engineer.

By an accident that occurred on the Pennsylvania Railroad, a few days ago, Enos J. Hoopes, an engineer, lost his life. Heroism such as Mr. Hoopes displayed on the occasion deserves more than a passing notice. The facts as we have heard them related, are as follows: A car attached to a freight train, bound west, had lost a wheel, and was being carried down a grade by the momentum of the train, pitching and jumping over cross ties, and making the fire fly out of the stones and iron. Mr. Hoopes was coming eastward on a train with fast freight, and as he neared the wrecked train, he thought he saw something wrong. It was dark, and to see more plainly, he stepped to the fireman's side, which is next the other track. Just then the wrecked car struck his engine, breaking his leg in four places, crushing his hip, tearing away half of one of his feet, and knocking him, in company with the fireman and brakeman, back into the tank. Every man upon Mr. Hoopes' engine was injured. The fireman and brakeman lay senseless on the floor of the tank. The conductor of the train and the other brakemen were on a rear car, and knew nothing of the disaster. The train was not so much injured as to delay its progress, and Mr. Hoopes knew that if it was not promptly stopped it must run into the hind end of the one next ahead, which would stop at a station less than three miles off for water. Mr. Hoopes, crushed and bleeding, dragged himself slowly and painfully over the prostrate bodies of his comrades to the throttle valve of his engine, shut off the steam, whistled down brakes, sounded the summons for the conductor, and fell back exhausted. When the train stopped, and the conductor came forward, Mr. Hoopes was trying to stop the flow of blood from his wounds by tying up his shattered leg, and said, "It is all up with me; do the best you can for me." He lingered until next day in great agony, which he bore with his usual bravery, and then died, lamented by all who knew him. Surely the name of Enos J. Hoopes should have a prominent place in the history of those who have heroically died at their posts in the conscientious discharge of their duty.—*Germantown (Pa.) Telegraph.*

Railroads in South America.

A correspondent of the New York *Herald* writing from Lima under date of the 22d ult., gives the following concerning new railroads in Peru and Bolivia:

On the 17th inst. the formal inauguration of the Lima & Huacho Railway, as far as the town of Chancay, forty eight miles from Lima, took place. Huacho, a beautiful village on the coast, about one hundred miles distant, has been for a long time the market garden of the capital, and in the centre of a very fertile and extensively cultivated district of the Republic. Some of the largest cotton and sugar estates in Peru are situated there, and the railway expects to derive its principal profits from the transportation of these products, the carriage by sea to Callao being very expensive and troublesome. After a solemn blessing of the locomotives and trains of the company by the Bishop of Jauija, the President, his Ministers, the diplomatic corps and a number of other persons proceeded to Chancay. For the first twenty miles the road offers nothing of particular interest, but, passing that distance, it is safe to say that this railroad is probably the most unique in the world.

For twelve miles the road proceeds along the seashore, on the side of a huge sand mountain, in some places 300 feet from the water, with a distance of from twelve inches to three feet from the edge of the precipice. The mountain of shifting sand rises above the track for another 300 feet, the train passing along its side like a fly crawling over a pane of glass. The rails in many places have to be based on bags filled with earth, as the foundation of sand is constantly giving way. Still engineers declare the road to be safe, and the rolling stock has been expressly constructed for the wonderful curves, of even nineteen in twenty-five that abound along the line. A large force of laborers

is constantly employed in keeping the track clear from sand, and in repairing the fissures made by the wind in the sand mountain above and below the line. Such was the fear experienced that several persons endeavored to find other means of returning to this city. No accident has, as yet, however, occurred on the portion of the road described.

Some time since, several influential French houses, among them Messrs. Erlanger & Co., of Paris, sent agents to Peru and Bolivia to survey and report upon a proposed line of railway from Tacna and La Paz, the capital of Bolivia. The report made was so favorable and the prospective profits so alluring, that immediate steps were taken by the interested parties to secure advantageous grants from the two governments. Meigares, in Bolivia, always ready to support any description of public work which might tend to the advancement of his country, issued a decree granting the privileges solicited, conceding a large portion of the public lands along the lines to the projectors, and actually deploring the circumstance that the condition of the Bolivian exchequer was so low that it was found impossible to assign an annual subvention to the undertaking. The government of Peru was equally liberal, and the line was adjudicated to Messrs. Hainsworth, of Tacna, the representatives of Erlanger & Co.

Another event, also relating to railway enterprise in Peru, is to take place on the 1st of January next. The road from Mollendo, on the coast, to Arequipa, about 100 miles in the interior, was commenced by Mr. Henry Meiggs, in March, 1868, and was not opened to the public on the date above-mentioned. The work has been executed under a contract with the present government, it being the first grand undertaking of the kind ever initiated in the country, and only owing to the perseverance of Mr. Meiggs, and the great energy which he has manifested under every class of difficulties, has the railway been successfully completed. The road has elicited many inquiries from engineers and scientific men, both in Europe and America, from the peculiar nature of its construction and the formidable obstacles offered by the ground traversed.

The Boston & Albany Report.

The annual report of the Directors of the Boston & Albany Railroad, covering the ten months ending with September, shows gross receipts in that time of \$5,785,987, and gross expenses of \$3,955,674, leaving a net balance of \$1,830,313. Of the receipts \$2,188,192 came from passengers, \$3,265,481 from freight and \$232,313 from mails and other sources. The principal items of expense were: Repairs of roadway, \$761,968; repairs of engines, \$367,995; repairs of passenger and freight cars, \$518,880; repairs of buildings, ferry, etc., \$216,188; transportation expenses, \$2,040,282; general expenses, \$50,357. From the net balance (\$1,830,313) deduct \$315,693 for interest on State loans and exchanges, the 5 per cent. July dividend of \$863,189, and the Pittsfield and North Adams Railroad 3 per cent. dividend of \$13,500, and an undivided surplus of \$637,731 remains,

which, however, is subject to a charge of \$40,000 to the sinking fund and a second dividend of \$13,500, to the Pittsfield & North Adams Railroad. The Massachusetts sinking fund increased \$120,653 in 1870; making an aggregate of \$1,785,884; but \$864,000 of the foreign debt was paid, which, with the premium on exchange, reduced the fund, November 30, to \$837,024. The Albany sinking fund, which earned \$36,943 during the year, was reduced by the payment of \$26,100 in interest and \$219,000 in bonds, which reduced it to \$298,404, against \$506,560 in 1869. The present value of both funds is \$1,135,429, and the contingent fund, composed of the unexpended earnings in former years, amounts to \$1,752,774. In future, dividends will be declared in May and November, instead of July and January. The capital stock authorized is \$26,000,000, and the total amount paid in, \$19,150,000; funded and floating debt, \$2,268,520; total cost of road equipment, \$21,938,628; number of miles operated, 269; number of miles run during ten months, 2,877,540; passengers carried in the cars, 3,754,733; number carried one mile, 78,808,920; tons of merchandise carried in the cars, 1,531,149; number of tons carried one mile, 148,871,491; number of men employed, exclusive of those engaged in construction, 4,361.

Free Passes in England.

It is recorded of a railway company whose shares are principally held in this country, although the line is far away, that as many as nine of its officers had authority to issue free passes. The line was then in very poor plight, and paid no dividend. It has since done better, nay, it is a very fair property, and we may conclude that the free pass system has undergone revision.

One of our great London railways, which pays little or no dividend, whose stock is at a frightful discount, seems to be a great issuer of free passes, if we may judge from a statement in the *Journal* a few weeks back by a correspondent.

It seems to us that the whole system of free passes should be swept away. No one, saving a director, head officer, and the men employed in conducting the trains, should be allowed to travel free, and the system of directors and officers of one line exchanging passes with the directors and officers of another line, appears to be highly objectionable. It is obvious that by this means a very large revenue may be lost to the companies, and without rhyme or reason. Indeed, we have heard of men in a large way of business getting on the boards of railway companies, not for the fees, not because they thought they had peculiar talents for railway management, but because they coveted the privilege of traveling over their own and other lines, hundreds of miles long, free of charge.

The proper thing is to do away with passes entirely. Let every one (with the few necessary exceptions named), pay, and should there be a case—as there is now and then—where a man is entitled to a free passage, let him pay the fare, but let the money be re-

turned to him by the directors. We may be sure that a board of directors would not repay hard cash excepting in cases where the claims were irresistible. We believe this plan is adopted by the Bristol & Exeter, a company which is well managed and pays a good dividend out of its resources. We would like to be enabled to say that in England the free pass system has been wholly abolished, and that all the traffic seen on a line is paying traffic, without a dead-head amongst it.—*Heralds's Railway Journal*.

PUBLISHER'S ANNOUNCEMENTS.

Engineering and the Railroad Gazette.

The undersigned is authorized by the publisher of *Engineering* to receive subscriptions for that admirable journal for \$8.22 in gold, per year.

American subscribers have usually been charged \$15 in currency per year for this journal by agents in this country. *Engineering* is the journal established in London and until lately published by the late Zerah Colburn. It contains usually about 40 quarto pages, a little smaller than those of the *RAILROAD GAZETTE*, 20 of which are filled with original articles on all subjects pertaining to engineering, profusely illustrated with the most admirable engravings. As an engineering journal it has probably no superior and scarcely an equal in the world. It gives a great deal of attention to railroad engineering and rolling stock, and describes and illustrates the principal American engineering structures more fully and completely, we fear we must confess, than any American journal has hitherto done.

We will supply *Engineering* and the *RAILROAD GAZETTE* together for one year for \$13 in currency until there is some considerable change in the price of gold. This is two dollars less than most Americans have heretofore paid for *Engineering* alone.

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—In the three weeks ending December 21, there were shipped east from Louisville, over the Louisville, New Albany & Chicago Railroad, about 3,500 bales of cotton. The receipts of hogs over the same road, to New Albany and Louisville, for the first twenty days of this month, were 7,950 at the former place, and 4,500 at the latter; total, 12,450. There seems, however, to have been a falling off in the shipments of horses, mules, sheep and cattle, at the points above-named, over this road, which is attributable to the low prices of stock ruling in the South this season. The receipts for the month were three car-loads of horses, two of mules, four of sheep, and four of cattle.

WANTS.

AN ENGINEER, who has had nearly three years' experience in the use of the instruments, in railroad location and construction, wants a situation as assistant, either in Railroad or Mining Engineering. Address ASSISTANT, *Gazette* Office.

WANTED—A complete file of the *RAILROAD ADVOCATE* published in New York by Zerah Colburn about 15 years ago. A purchaser can be found by applying at this office personally or by letter.

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Portage, Winnebago & Superior Railroad.

NOTICE TO CONTRACTORS.

Proposals will be received at the office of Capt. D. W. WELLMAN, Chief Engineer, at Menasha, Wis., until

Twelve o'clock Noon, on Wednesday, March 1st, 1871,

for the Grading, Masonry and Bridging on that portion of the Portage, Winnebago & Superior Railroad lying between Doty Island and the Wisconsin River at Stevens' Point, a distance of about sixty-four (64) miles.

Proposals will be received for the work in each Section (of about one (1) mile), or for the whole work; but parties making proposals for the whole will be required to specify the prices for work on each Section.

Blank forms, setting forth the different items for which proposals will be received, will be furnished on application; and Plans, Profiles and Specifications can be seen on and after Monday, January 29th, at the office of the Chief Engineer, and at the office of the undersigned, in Ordan Building, corner Clark and Lake streets, Chicago, Ill., on and after Monday, February 6th, 1871.

Proposals, accompanied by Plans, are also invited for the Construction of the Railroad Bridge across Wolf River—to be either of Wood or Iron—consisting of one span of one hundred and fifty (150) feet, and one draw of sixty (60) feet, clear space. The bridge to be first class in every particular, and able to meet the requirements of a first-class road.

Separate proposals will also be received for the whole of the Span Bridging on the above-described work.

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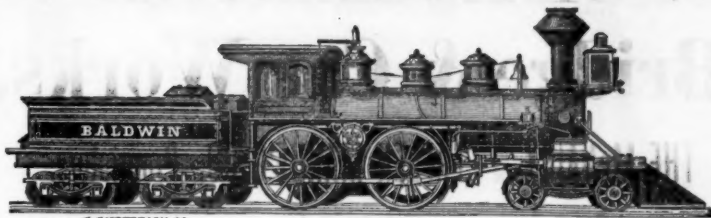
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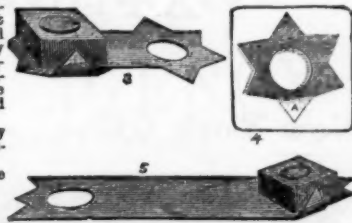
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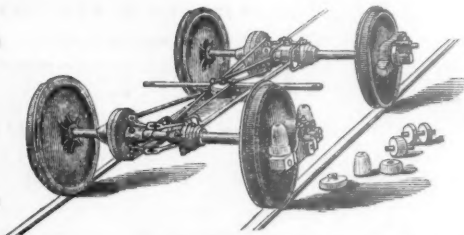
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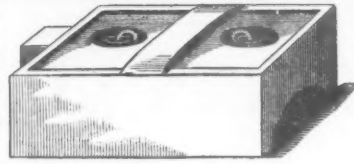
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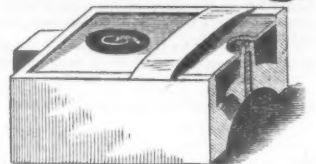
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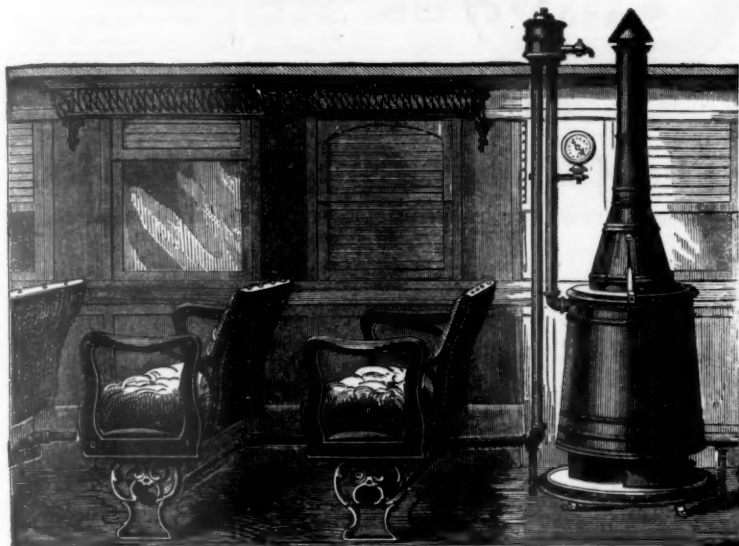
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FOR CRANK PINS, CAR AXLES, &C.

Also, Manufacturers of the Celebrated Brand,

"HUSSEY, WELLS & CO. CAST SPRING STEEL."

☞ For Elliptic Springs for Railway Cars and Locomotives. ☞

Office and Works, Pittsburgh, Pa.

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139 and 141 Federal St., BOSTON. | 30 Gold St., - - - NEW YORK.

FERRIS & MILES, Steam Hammers & Machine Tools

24th and Wood Streets, PHILADELPHIA.

THE STEAM HAMMER AS IT SHOULD BE!

Simple in Construction—Powerful in Action—Convenient in Handling—Moderate in Price!

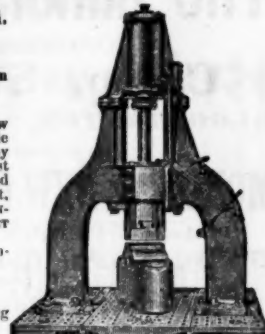
These Hammers have our Patent Skew Ram, which secures the most extensive die surface, and our patent valve gear; by which is accomplished, with the most perfect adjustment, either the heavy dead blow for drawing down work, or the light, quick blow for finishing, AND THIS WITH ONLY TWO MOVING PIECES—NOTHING TO GET OUT OF ORDER.

All sizes, from 100 lbs. upwards, with single or double frames.

ENGINE LATHES,

Extra Strong and Heavy, capable of doing the heaviest and most accurate work.

Also, our **PATENT SCREW-CUTTING LATHES**, which will do either general turning or screw cutting, without change of gear-wheels.



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The Keystone Bridge Company

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☞ This Company possesses unrivaled facilities for manufacturing and erecting every description of Iron and Wooden Railway and Road Bridges, Roofs, Turn-Tables and Buildings, "Linville and Piper" Patent Iron Bridges, Self-Sustaining Pivot Bridges, Suspension Bridges, and Ornamental Park Bridges. Contractors for Wooden or Iron Bridges of any pattern, as per plans and specifications. Circulars sent on application.

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Are now prepared to receive and promptly execute orders for RAILROAD FROGS and CROSSINGS warranted to prove satisfactory to purchasers.

For DURABILITY, SAFETY and ELASTICITY—being a combination of Steel, Boiler Plate and Wood—they are UNEQUALED. As Certificates of Prominent Railroad Officials will testify.

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The New Jersey Steel and Iron Co.,
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MARTIN STEEL!

Acknowledged by all who have used it to be the best material now made for

Firebox Plates, Locomotive Crank Pins, Piston Rods, Axles,

And all the finer machine purposes, such as

Rollers for Cotton Machinery, Lathe Screws, Sewing Machine Work, &c., &c.

The special features of this Steel are its REMARKABLE TOUGHNESS, its softness and entire freedom from hard spots, which obviate the necessity of annealing before turning.

The process by which this Steel is made differs entirely from any other in use, enabling it to be sold at lower prices than any other good steel, while it possesses properties hitherto unknown, and of the greatest importance for many uses.

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New England M. M. Insurance Co., of Boston,
ASSETS \$1,197,000.

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ASSETS \$340,000.

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The Illinois Central Railroad

ARE PREPARED TO TAKE FREIGHT FOR

**Cairo, St. Louis, Peoria,
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And All Points in the Central and Southern parts of the State;

MOBILE & NEW ORLEANS BY RAIL OR RIVERAnd ALL POINTS on the MISSISSIPPI below CAIRO. Also, to
Freeport, Galena and Dubuque.Freight Forwarded with Promptness and Despatch, and
Rates at all times as LOW as by any other Route.BY THE COMPLETION OF THE BRIDGE AT DUNLEITH,
THEY ARE ENABLED TO TAKE FREIGHT TO ALL POINTS WEST OF DUBUQUE
WITHOUT CHANGE OF CARS!DELIVER FREIGHT IN CHICAGO ONLY at the FREIGHT DEPOT of the Com-
pany, foot of South Water St. Parties ordering Goods from the East should have the packages marked:**"Via Illinois Central Railroad."**For THROUGH BILLS OF LADING, and further information,
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OF NEW JERSEY.

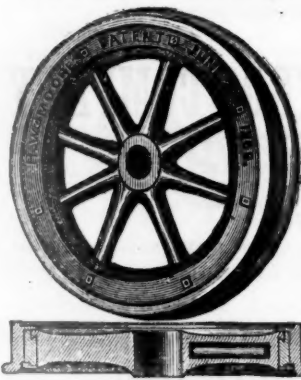
Proprietors of

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FOR THE MANUFACTURE OF**ELASTIC CAR WHEELS,**

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Noiseless, Safe, Durable and Economical.

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Demonstrating beyond question its superior working capacity, and great ability to withstand the
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Established, 1859.

No. 211 Superior St. CLEVELAND, O.

Over 20,000 Cars covered with this Roof! We claim that these
Roofs will keep Cars dry, and will last as long as the
Cars they cover without any extra expense
after once put on.

SEND FOR CIRCULARS.

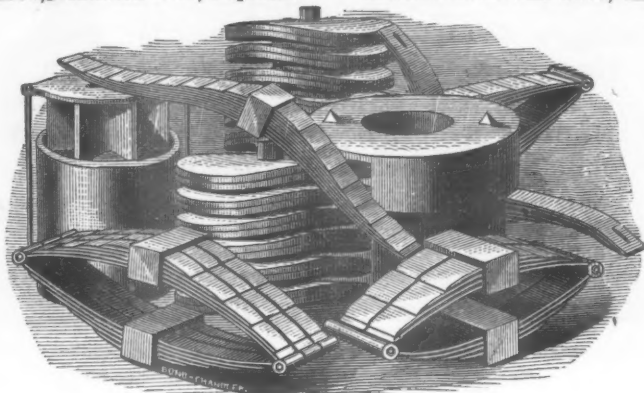


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TAYLOR BROTHERS & CO.CAST STEEL LOCOMOTIVE TYRES,
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BOILER PLATES.This Iron is unequalled for strength and durability, sound-
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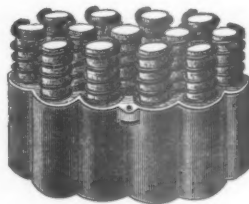


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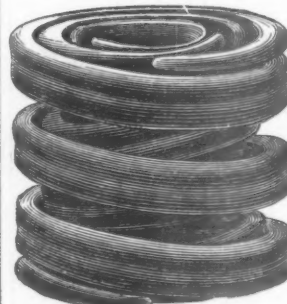
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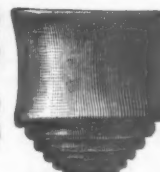
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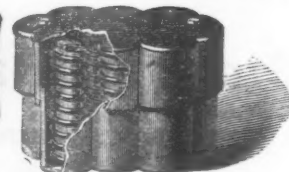
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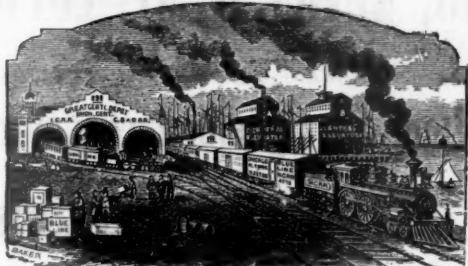
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THE WESTINGHOUSE AIR BRAKE!A simple, cheap and effective invention, whereby the entire control of a train of cars is placed in
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satisfactory. Full information furnished on application.

Great Central Route. "BLUE LINE."

ORGANIZED JANUARY 1, 1867.

1871.



1871.

OWNED AND OPERATED BY THE

Michigan Central, Illinois Central, Chicago, Burlington & Quincy, Chicago & Alton, Great Western (of Canada), New York Central, Hudson River, Boston & Albany, and Providence and Worcester Railroads.

THE "BLUE LINE" is the only route that offers to shippers of freight the advantages of an unbroken gauge through from Chicago to the Seaboard, and to all interior points on the line of Eastern Connections beyond Suspension Bridge and Buffalo. All Through Freight is then transported between the most distant points of the roads in interest.

WITHOUT CHANGE OF CARS!

The immense freight equipment of all the roads in interest is employed, as occasion requires, for the through service of this line, and has of late been largely increased. This line is now prepared to extend facilities for the transit and delivery of all kinds of freight in quicker time and in better order than ever before.

The Blue Line Cars

are all of a solid, uniform build, thus largely lessening the chances of delay from the use of cars of a mixed construction, and the consequent difficulty of repairs, while remote from their own roads. The Blue Line is operated by the railroad companies who own it, without the intervention of intermediate parties between the Roads or Line and the public.

Trains run through with regularity IN FOUR OR FIVE DAYS to and from New York and Boston. Special care given to the Safe and Quick Transport of Property Liable to Breakage or Injury, and to all Perishable Freight.

Claims for overcharges, loss or damage, promptly settled upon their merits. Be particular and direct all shipments to be marked and consigned via

"BLUE LINE."

FREIGHT CONTRACTS given at the offices of the company in Chicago, New York and Boston.

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THE EMPIRE TRANSPORTATION COMPANY'S

Fast Freight Line to the East

TO THE COAL AND OIL REGIONS,
Via Michigan Southern, Lake Shore, and Philadelphia & Erie R. R.'s,
WITHOUT TRANSFER!

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—OF—

EVERY STYLE!

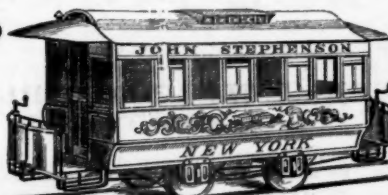
Orders Promptly Filled.

CARS,

LIGHT, STRONG!

—AND—

ELEGANT!



CHICAGO, ROCK ISLAND & PACIFIC RAILROAD.

THE DIRECT ROUTE FOR

JOLIET, MORRIS, OTTAWA, LASALLE, PERU, HENRY, PEORIA,
Lacon, Geneseo, Moline,

ROCK ISLAND, DAVENPORT,
Muscatine, Washington, Iowa City,

GRINNELL, NEWTON, DES MOINES,

COUNCIL BLUFFS & OMAHA!

CONNECTING WITH TRAINS ON THE UNION PACIFIC RAILROAD, FOR

Cheyenne, Denver, Central City, Ogden, Salt Lake,
White Pine, Helena, Sacramento, San Francisco,

And Points in Upper and Lower California; and with Ocean Steamers at San Francisco, for all Points in China, Japan, Sandwich Islands, Oregon and Alaska.

TRAINS LEAVE their Splendid new Depot, on VanBuren Street, Chicago, as follows:

	LEAVE	ARRIVE
PACIFIC EXPRESS, (Sunday excepted).....	10.00 a. m.	4.15 p. m.
PERU ACCOMMODATION, (Sundays excepted).....	4.30 p. m.	9.45 a. m.
PACIFIC EXPRESS, (Saturdays excepted).....	10.00 p. m.	[Mon. ex. 7.00 a. m.]

ELEGANT PALACE SLEEPING COACHES!

Run Through to Peoria and Council Bluffs, Without Change.

Connections at LA SALLE, with Illinois Central Railroad, North and South; at PEORIA, with Peoria, Pekin & Jacksonville Railroad, for Pekin, Virginia, &c.; at PORT BYRON JUNCTION, for Hampton, LeClaire, and Port Byron; at ROCK ISLAND, with Packets North and South on the Mississippi River.

For Through Tickets, and all desired information in regard to Rates, Routes, etc., call at the Company's Offices, No. 37 South Clark Street, Chicago, or 257 Broadway, New York.

A. M. SMITH, Gen. Pass. Agent. RUGH RIDDLE, Gen. Supt. P. A. HALL, Asst. Gen. Supt.

KANSAS PACIFIC RAILWAY.

Great Smoky Hill Route

THROUGH KANSAS TO DENVER, COLORADO,

Connecting with the DENVER PACIFIC R. R. for CHEYENNE; forming, in connection with the UNION and CENTRAL PACIFIC R. R.'s, a NEW ALL-RAIL ROUTE to

Colorado, Wyoming, Utah, Montana,
NEVADA, CALIFORNIA,

AND THE PACIFIC COAST.

THE ONLY ROUTE RUNNING PULLMAN DRAWING-ROOM & SLEEPING CARS THROUGH TO DENVER.
No Omnibus or Ferry Transfer!

Direct Connections made in UNION DEPOTS at Kansas City [State Line.] with the Hannibal & St. Joseph, North Missouri and Missouri Pacific Railroads.

Daily Trains leave Kansas City, State Line and Leavenworth, for Lawrence, Topeka, Emporia, Humboldt, New Chicago, Chetopa, Junction City, Abilene, Salina, Brookville, Ellsworth, Hays, KIT CARSON, DENVER, GREELEY, CHEYENNE, OGDEN, SALT LAKE CITY, CORINNE,

Sacramento & San Francisco.

Connect at Kit Carson with Southern Overland Passenger and Mail Coaches for PUEBLO, TRINIDAD, SANTA FE, and all principal points in

Old and New Mexico and Arizona.

Connect at DENVER with the Colorado Central Railroad and Fast Concord Coaches, for Golden City, Black Hawk, Central City, Idaho City, Georgetown and Fair Play.

Passenger and Freight Rates as low and conveniences as ample as by any Route.

Ask for Tickets via KANSAS PACIFIC RAILWAY, which can be obtained at all principal ticket offices in the United States.

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Lawrence, Kansas. Kansas City, Mo. Lawrence, Kan.

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Five Million Acres of Choice Farming Lands, situated along the line of this Great National Route, at from one to six dollars per acre. For full particulars, apply to
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THE ERIE & PACIFIC DISPATCH CO.

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Western Union Railroad.

CHICAGO & NORTHWESTERN DEPOT, CHICAGO. MILWAUKEE & CHICAGO DEPOT, MILWAUKEE.

THE DIRECT ROUTE! CHICAGO, RACINE & MILWAUKEE,

Beloit, Savanna, Clinton, Ft. Byron, Davenport, Mineral Point,
Madison, Freeport, Fulton, Lyons, Rock Island, Sabula,
Galena, Dubuque, Des Moines, Council Bluffs,

OMAHA, SAN FRANCISCO

AND ALL PRINCIPAL POINTS IN

Southern and Central Wisconsin, Northern Illinois, and Central and Northern Iowa.

FRED. WILD, Gen. Ticket Agent.

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THE FAVORITE THROUGH PASSENGER ROUTE!

Chicago, Burlington & Quincy RAILROAD LINE.

8 THROUGH EXPRESS TRAINS DAILY!

FROM CHICAGO	Hours	1st Class Fare.	FROM CHICAGO	Days	1st Class Fare.
TO OMAHA, - - -	23	\$20.00	TO DENVER, - - -	2 1/2	\$63.00
" ST. JOSEPH, - - -	21	19.50	" SACRAMENTO, - - -	4 1/2	118.00
" KANSAS CITY, - - -	22	20.00	" SAN FRANCISCO, - - -	5	118.00

TRAINS LEAVE CHICAGO from the Great Central Depot, foot of Lake Street, as follows:

BURLINGTON, KEOKUK, COUNCIL BLUFFS & OMAHA LINE

7:40 A. M. MAIL AND EXPRESS. (Except Sunday,) stopping at all stations; making close connections at Mendota with Illinois Central for Amboy, Dixon, Freeport, Galena, Dunleith, Dubuque, LaSalle, El Paso, Bloomington, &c.

10:45 A. M. PACIFIC FAST LINE. (Except Sunday,) stopping at Riverside, Hinsdale, Aurora, Leland, Mendota, Princeton, Buda, Kewanee, Galva, Galesburg, and all stations West and South of Galesburg.

ELEGANT DAY COACHES and PULLMAN PALACE DRAWING ROOM CARS are attached to this train daily from Chicago.

TO COUNCIL BLUFFS & OMAHA WITHOUT CHANGE!

9:00 P. M. PACIFIC NIGHT EXPRESS. (Daily, except Saturday,) for Burlington, Ottumwa, Des Moines, Nebraska City, Council Bluffs, Omaha, and all points West. Pullman Drawing Room Sleeping Car attached to this train daily from Chicago to Burlington, and Elegant Day Coaches, from Chicago to Council Bluffs and Omaha, without change! This is the route between

CHICAGO, COUNCIL BLUFFS & OMAHA,

—RUNNING THE CELEBRATED—

Pullman Palace Dining Cars!

49 MILES THE SHORTEST ROUTE BETWEEN

Chicago & Keokuk,

And the Only Route Without Ferrying the Mississippi River!

QUINCY, ST. JOSEPH, LEAVENWORTH & KANSAS CITY LINE.

7:40 A. M. MAIL AND EXPRESS. (Except Sunday,) stopping at all stations between Chicago and Galesburg; making close connections at Mendota with Illinois Central for Amboy, Dixon, Freeport, Dunleith, Dubuque, LaSalle, El Paso, Bloomington, &c.

10:45 A. M. PACIFIC EXPRESS. (Daily, except Sunday,) with SLEEPING CARS attached, running through from Chicago to KANSAS CITY, **Without Change!**

9:00 P. M. PACIFIC NIGHT EXPRESS. (Daily,) with Pullman Palace Drawing Room Sleeping Car attached running through from Chicago to QUINCY.

Kansas City, Lawrence, Topeka and Denver,

WITHOUT CHANGE!

64 MILES THE SHORTEST AND ONLY ROUTE BETWEEN

Chicago and Kansas City!

WITHOUT CHANGE OF CARS OR FERRY.

115 MILES The Shortest Route bet. Chicago & St. Joseph.

THE SHORTEST, BEST AND QUICKEST ROUTE BETWEEN CHICAGO AND

Atchison, Weston, Leavenworth, Lawrence,

AND ALL POINTS ON THE KANSAS PACIFIC R'Y.

Local Trains Leave **RIVERSIDE & HINSDALE ACCOMMODATION.** 7:00 A. M. 1:30 & 6:15 P. M.
GALESBURG PASSENGER. 3:00 P. M.
MENDOTA PASSENGER. 4:15 P. M.
AURORA PASSENGER. 5:30 P. M.

Ask for Tickets via Chicago, Burlington & Quincy Railroad, which can be obtained at all principal offices of connecting roads, at Company's office, 63 Clark Street, and at Great Central Depot, Chicago at as low rates as by any other route.

ROBT HARRIS, Gen'l Superintendent, CHICAGO.
SAM'L POWELL, Gen'l Ticket Agent, CHICAGO.
E. A. PARKER, Gen. West. Pass. Agt., CHICAGO.

THE GREAT THROUGH PASSENGER ROUTE TO KANSAS

IS VIA THE OLD RELIABLE

HANNIBAL & ST. JOSEPH SHORT LINE.

Crossing the Mississippi at Quincy and the Missouri at Kansas City on New Iron Bridges; running Three Daily Express Trains, Through Cars and Pullman Sleeping Palaces from Chicago & Quincy to St. Joseph & Kansas City.

The Advantages gained by this Line over any other Route from Chicago, are:

115 MILES THE SHORTEST!

To St. Joseph, Atchison, Hiawatha, Waterville, Weston, Leavenworth,

64 MILES THE SHORTEST!

To Kansas City, Fort Scott, Lawrence, Ottawa,

Garnett, Iola, Humboldt, Topeka, Burlingame, Emporia, Manhattan, Fort Riley, Junction City, Salina, Ellsworth, Hays, Sheridan, Olathe, Paola, Cherokee Neutral Lands, Baxter Springs, Santa Fe, New Mexico, and all points on the KANSAS PACIFIC, and MISSOURI RIVER, FT. SCOTT & GULF R. R's, with which we connect at Kansas City Union Depot.

THIS BEING THE SHORTEST LINE AND QUICKEST, is consequently the cheapest; and no one that is posted thinks of taking any other Route from Chicago to reach principal points in

Missouri, Kansas, Indian Territory, or New Mexico.

DAILY OVERLAND STAGES from west end Kansas Pacific Railway, for Pueblo, Santa Fe, Denver, and points in Colorado and New Mexico.

This is also a most desirable Route, via St. Joseph, to Brownsville, Nebraska City, Council Bluffs, and Omaha, connecting with the Union Pacific Railroad for Cheyenne, Denver, Salt Lake, Sacramento, San Francisco, and the Pacific coast.

Through Tickets for Sale at all Ticket Offices. Baggage Checked Through, and Omnibus Transfers and Berriage avoided.

P. B. GROAT, Gen. Ticket Agent, HANNIBAL, MO.
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Old, Reliable, Air-Line Route!

CHICAGO, ALTON & ST. LOUIS R. R.

SHORTEST, QUICKEST AND ONLY DIRECT ROAD TO

Bloomington, Springfield, Jacksonville, Alton,

—AND—

ST. LOUIS!

WITHOUT CHANGE OF CARS.

THE ONLY ROAD MAKING IMMEDIATE CONNECTIONS AT ST. LOUIS WITH MORNING AND EVENING TRAINS

—FOR—

ATCHISON, LEAVENWORTH, KANSAS CITY,

Lawrence, Topeka, Memphis, New Orleans,

And All Points South and Southwest.

TRAINS leave Chicago from the West-side Union Depot, near Madison Street Bridge.

	Depart.	Arrive.
EXPRESS MAIL	9:15 A. M.	8:05 P. M.
JOLIET ACCOMMODATION	4:00 P. M.	9:40 A. M.
NIGHT EXPRESS	7:30 "	12:50 P. M.
LIGHTNING EXPRESS	9:00 "	7:30 A. M.

Sundays excepted.

Daily; Saturdays it runs to Bloomington only.

Saturdays and Sundays excepted. Monday mornings this train runs from Bloomington to St. Louis.

This is the ONLY LINE Between CHICAGO & ST. LOUIS RUNNING

Pullman's Palace Sleeping and Celebrated Dining Cars!

BAGGAGE CHECKED THROUGH.

Through Tickets can be had at the Company's office, No. 55 Dearborn street, Chicago, or at the Depot, corner of West Madison and Canal streets, and at all principal Ticket Offices in the United States and Canada. Rates of Fare and Freights as low as by any other Route.

A. NEWMAN, Gen. Pass. Agent.**J. C. McMULLIN,** Gen. Supt.

North Missouri R. R.

PASSENGERS FOR

KANSAS AND THE WEST,

ARE REMINDED THAT

THE NORTH MISSOURI R. R.

—IS—

11 MILES SHORTER than any other Route!

BETWEEN

St. Louis and Kansas City.

15 Miles Shorter between ST. LOUIS and LEAVENWORTH

—AND—

50 MILES SHORTER TO ST. JOSEPH!

THAN ANY OTHER LINE OUT OF ST. LOUIS.

Three Through Express Trains Daily!

Pullman's Celebrated Palace Sleeping Cars on all Night Trains!

FOR TICKETS, apply at all Railroad Ticket Offices, and see that you get your Tickets via St. Louis and North Missouri Railroad.

JAMES CHARLTON,
Gen. Pass. and Ticket Agent, St. Louis.

W. R. ARTHUR,
General Superintendent, St. Louis.

Pacific Railroad of Missouri.

THE MOST DIRECT AND RELIABLE ROUTE FROM ST. LOUIS THROUGH TO

KANSAS CITY, LEAVENWORTH & ATCHISON,

WITHOUT CHANGE OF CARS!

Close Connections at KANSAS CITY with Missouri Valley, Missouri River, Ft. Scott & Gulf, and Kansas Pacific R'ys, for Weston, St. Joseph, Junction City, Fort Scott, Lawrence, Topeka, Sheridan, Denver, Fort Union, Santa Fe, and

ALL POINTS WEST!

At SEDALIA, WARRENSBURG and PLEASANT HILL, with Stage Lines for Warsaw, Quincy, Bolivar, Springfield, Clinton, Osceola, Lamar, Carthage, Granby, Neosho, Baxter Springs, Fort Gibson, Fort Smith, Van Buren, Fayetteville, Bentonville.

PALACE SLEEPING CARS on all NIGHT TRAINS.

Baggage Checked Through Free!

THROUGH TICKETS for sale at all the Principal Railroad Offices in the United States and Canada. Be Sure and Get your Tickets over the PACIFIC R. R. OF MISSOURI.

W. B. HALE,
Gen. Pass. and Ticket Agt.

THOS. McKISSOCK,
General Superintendent.

61 Miles the Shortest Line!

— FROM —

CHICAGO TO NEW YORK.

Pitts., Ft. Wayne & Chicago

PENNSYLVANIA CENTRAL

IS THE ONLY ROUTE

Running its Entire Trains THROUGH to Philadelphia and New York, and the only Route running Three Daily Lines of Pullman Day and Sleeping Palaces, from Chicago to

PITTSBURGH, HARRISBURG, PHILADELPHIA & NEW YORK,

WITHOUT CHANGE!

WITH BUT ONE CHANGE TO

BALTIMORE, PROVIDENCE, NEW HAVEN, HARTFORD, SPRINGFIELD, WORCESTER & BOSTON!

AND THE MOST DIRECT ROUTE TO WASHINGTON.

Trains Leave WEST SIDE UNION DEPOT, corner West Madison and Canal Streets, as follows:

	Mail.	Fast Express.	Pacific Exp.	Night Exp.
Leave—CHICAGO.....	5.30 A. M.	9.00 A. M.	5.15 P. M.	9.00 P. M.
Arrive—PLYMOUTH.....	9.50 "	12.03 P. M.	8.45 "	12.35 A. M.
" PORT WAYNE.....	12.30 P. M.	2.05 "	11.15 "	2.10 "
" LIMA.....	3.34 "	4.06 "	1.23 A. M.	4.40 "
" FOREST.....	4.43 "	5.08 "	2.45 "	7.07 "
" CRESTLINE.....	6.30 "	6.30 "	4.20 "	8.55 "
Leave—CRESTLINE.....	6.00 A. M.	6.50 "	4.30 "	9.35 "
Arrive—MANSFIELD.....	6.40 "	7.17 "	5.00 "	10.05 "
" ORRVILLE.....	9.15 "	9.05 "	6.54 "	11.55 "
" ALLIANCE.....	11.10 "	10.40 "	8.30 "	1.30 P. M.
" PITTSBURGH.....	11.57 "	1.05 A. M.	10.10 P. M.	4.40 "
" CRESSON.....	11.57 "	5.44 "	4.45 "	10.00 "
" ALTOONA.....	12.48 A. M.	6.55 "	5.55 "	2.40 A. M.
" HARRISBURG.....	5.30 "	11.25 "	10.45 "	2.50 "
" PHILADELPHIA.....	6.50 "	3.15 "	3.00 "	6.50 "
" NEW YORK, VIA PHILADELPHIA.....	10.30 "	6.30 "	6.41 "	10.30 "
" NEW YORK, VIA ALLENTOWN.....	10.30 "	6.30 "		10.30 "
" BALTIMORE.....	9.15 P. M.	3.05 "	2.30 A. M.	9.15 P. M.
" WASHINGTON.....	1.00 "	5.15 "	5.45 "	1.00 "
" BOSTON.....	9.00 "	5.50 A. M.	6.00 "	9.00 "

Boston and New England Passengers will find this Route especially Desirable, as it gives them an opportunity of Seeing the FINEST VIEWS AMONG THE ALLEGHANY MOUNTAINS.

Besides Visiting PITTSBURGH, PHILADELPHIA and NEW YORK, without extra cost!

All New England Passengers holding Through Tickets will be Transferred, with their Baggage, to Rail and Boat Connections in NEW YORK, Without Charge!

THROUGH TICKETS for sale at the Company's Offices, at 65 Clark St.; 52 Clark St.; cor. Randolph and LaSalle Sts.; and at Depot, Chicago. Also at Principal Ticket Offices in the West.

CLOSE CONNECTIONS Made at LIMA for all Points on the Dayton & Michigan and the Cincinnati, Hamilton & Dayton Railways, and at CRESTLINE for Cleveland and Columbus.

Express Trains are Equipped with WESTINGHOUSE AIR BRAKES, The Most Perfect Protection Against Accidents in the World!

F. R. MYERS, Gen. Pass. & Tkt. Agt. P. F. W. & C. Ry Chicago. | **W. C. CLELAND,** Gen. Western Pass. Agt. P. F. W. & C. Ry, Chicago.
T. L. KIMBALL, Gen. Western Pass. Agt. Penn. Cen. R. R. Chicago.

Broad Gauge! Double Track!

ERIE RAILWAY.

4 EXPRESS TRAINS DAILY!
From Cleveland, Dunkirk and Buffalo, 625 Miles, to New York, WITHOUT CHANGE of Coaches!

The Trains of this Railway are run in DIRECT CONNECTION WITH ALL WESTERN AND SOUTHERN LINES, for

Elmira, Williamsport, Oswego, Great Bend, Scranton, Newburgh,
NEW YORK, ALBANY, BOSTON, PROVIDENCE,
AND PRINCIPAL NEW ENGLAND CITIES.

New and Improved DRAWING ROOM COACHES are attached to the DAY EXPRESS Running THROUGH TO NEW YORK.

SLEEPING COACHES, Combining all Modern Improvements, with perfect Ventilation and the peculiar arrangements for the comfort of Passengers incident to the BROAD GAUGE, accompany all night trains to New York.

CONNECTIONS CERTAIN! as Trains on this Railway will, when necessary, wait from one to two hours for Western trains.

All Trains of Saturday run directly Through to New York.

Ask for Tickets via Erie Railway, which can be procured at 66 Clark Street Chicago, and at all Principal Ticket offices in the West and Southwest.

L. D. RUCKER, Gen'l Superintendent New York. | **A. J. DAY,** Western Passenger Agent, Chicago. | **WM. R. BARR,** Gen'l Passenger Agent, New York

Pan-Handle

— AND —

Penn'a Central Route East!

SHORTEST AND QUICKEST ROUTE, VIA COLUMBUS, TO
PITTSBURGH, BALTIMORE, PHILADELPHIA & NEW YORK

On and after Sunday, NOVEMBER 20th, 1870, Trains for the East will run as follows:

[DEPOT CORNER CANAL AND KINZIE STS., WEST SIDE.]

7:40 A. M. DAY EXPRESS.
[SUNDAYS EXCEPTED.] Via Richmond. Arriving at

COLUMBUS... 3:00 A. M. | HARRISBURG... 10:35 P. M. | NEW YORK... 6:40 A. M. | WASHINGTON... 5:45 A. M.
PITTSBURGH... 12:15 M. | PHILADELPHIA... 8:10 A. M. | BALTIMORE... 2:30 A. M. | BOSTON... 5:05 P. M.

7:10 P. M. NIGHT EXPRESS.
[SUNDAYS EXCEPTED.] Arriving at:

COLUMBUS... 11:15 A. M. | HARRISBURG... 5:30 A. M. | NEW YORK... 11:40 A. M. | WASHINGTON... 1:10 P. M.
PITTSBURGH... 7:35 P. M. | PHILADELPHIA... 9:50 A. M. | BALTIMORE... 9:30 A. M. | BOSTON... 11:50 P. M.

Palace Day and Sleeping Cars

Run Through to COLUMBUS, and from Columbus to NEW YORK, WITHOUT CHANGE!

ONLY ONE CHANGE TO NEW YORK, PHILADELPHIA, OR BALTIMORE!

CINCINNATI & LOUISVILLE AIR LINE SOUTH.

35 Miles the Shortest Route to Cincinnati.

18 Miles the Shortest Route to Indianapolis and Louisville.

3 Hours the Quickest Route to Cincinnati!

THE SHORTEST AND BEST ROUTE TO

Columbus, Chillicothe, Hamilton, Wheeling, Parkersburg, Evansville, Dayton, Zanesville, Marietta, Lexington, Terre Haute, Nashville,

ALL POINTS IN CENTRAL & SOUTHERN OHIO, & INDIANA, KENTUCKY & VIRGINIA.

— QUICK, DIRECT AND ONLY ALL RAIL ROUTE TO —

New Orleans, Memphis, Mobile, Vicksburg, Charleston, Savannah,
AND ALL POINTS SOUTH.

Cincinnati, Indianapolis and Louisville Trains run as follows:

THROUGH WITHOUT CHANGE OF CARS!

7.40 A. M. (Sundays excepted) Arriving at

8.05 P. M. (Saturdays excepted) Arriving at

LOGANSPORT... 1:15 P. M. | LOGANSPORT... 1:15 A. M.
KOKOMO... 2:33 P. M. | KOKOMO... 2:31 A. M.
CINCINNATI... 10:10 P. M. | CINCINNATI... 9:35 A. M.
INDIANAPOLIS... 5:00 P. M. | INDIANAPOLIS... 5:40 A. M.
LOUISVILLE... 11:30 P. M. | LOUISVILLE... 3:50 P. M.

Lausung Accommodation: Leaves 3:40 P. M. Arrives 10:55 A. M.

PULLMAN'S PALACE SLEEPING CARS!

Accompany all Night Trains between Chicago and Cincinnati or Indianapolis.

Ask for Tickets via COLUMBUS for the East, and via "The AIR LINE" for Cincinnati, Indianapolis, Louisville and points South. Tickets for sale and Sleeping Car Berths secured at 95 RANDOLPH STREET, CHICAGO, and at Principal Ticket Offices in the West and Northwest.

WM. L. O'BRIEN, Gen. Pass. and Ticket Agent, Columbus.

I. S. HODSDON, Northwestern Pass. Agt. Chicago.

D. W. CALDWELL Gen. Supt. Columbus.

The Great Favorite Route for Missouri, Nebraska and Iowa.

KANSAS CITY, ST. JOSEPH

— AND —

COUNCIL BLUFFS

THROUGH LINE!

3 EXPRESS PASSENGER TRAINS Leave Union Depot Daily, on the arrival of Eastern Southern and Western Trains, crossing the Missouri River on the New Iron Bridge at KANSAS CITY, passing the cities of

LEAVENWORTH, ATCHISON, SAINT JOSEPH,
— AND —
NEBRASKA CITY.

Connecting at COUNCIL BLUFFS with Iowa Lines for all prominent points in Iowa, and making DIRECT CONNECTION at OMAHA with the Great Union Pacific Railroad, for

CHEYENNE, DENVER, SALT LAKE, SACRAMENTO, SAN FRANCISCO
And the Pacific Coast.

Pullman's Palace Sleeping Cars!

ON ALL NIGHT TRAINS.

Ask for Tickets via the People's Favorite Route, Kansas City, St. Joseph & Council Bluffs Railroad Line.

A. L. HOPKINS, Gen. Superintendent ST. JOSEPH, Mo.

A. C. DAWES, Gen. Passenger Agent, ST. JOSEPH, Mo.

ILLINOIS CENTRAL RAILROAD.

PASSENGER TRAINS LEAVE CHICAGO FROM THE GREAT CENTRAL DEPOT, FOOT OF LAKE ST.

ST. LOUIS AND CHICAGO THROUGH LINE.

No Change of Cars from Chicago to St. Louis.

9:20 A. M. DAY EXPRESS Sundays Ex.
Arriving in ST. LOUIS at 10:30 P. M.

8:15 P. M. FAST LINE. Saturdays Excepted.
Arriving at ST. LOUIS at 8:00 A. M.

AT ST. LOUIS, Direct Connections are Made FOR

Jefferson City, Sedalia, Pleasant Hill, Macon, Kansas City,

LEAVENWORTH, ST. JOSEPH & ATCHISON,

—Connecting at KANSAS CITY for—

LAWRENCE, TOPEKA, JUNCTION CITY, SALINA, SHERIDAN,

Denver and San Francisco!

CAIRO, MEMPHIS AND NEW ORLEANS LINE.

No Change of Cars from Chicago to Cairo.

9:20 A. M. CAIRO MAIL, Sundays Excepted.
Arriving at Cairo 2:05 A. M., Memphis 12:45 P. M., Mobile 9:25 A. M.
Vicksburg 9:25 A. M., New Orleans 11:05 A. M.

8:15 P. M. CAIRO EXPRESS, Except Saturdays.
Arriving at Cairo 12:24 P. M., Memphis 4:15 A. M., Little Rock 7:00 P. M., Vicksburg 8:10 P. M., New Orleans 1:30 A. M.

4:50 P. M. CHAMPAIGN PASSENGER,
Arriving at Champaign at 10:45 P. M.

THIS IS THE ONLY DIRECT ROUTE TO

Humboldt, Corinth, Grand Junction, Little Rock, Hot Springs, Selma, Canton, Grenada, Columbus, Meridian, Enterprise,

MEMPHIS, VICKSBURG, NEW ORLEANS & MOBILE.

At NEW ORLEANS, connections are made for

GALVESTON, INDIANOLA,

And all Parts of Texas.

NOTICE.—This Route is from 100 to 150 MILES SHORTER, and from 12 to 24 HOURS QUICKER than any other.

THIS IS ALSO THE ONLY DIRECT ROUTE TO

DECATUR, TERRE HAUTE, VINCENNES & EVANSVILLE.

Peoria and Keokuk Line.

9:20 A. M. KEOKUK PASSENGER, Sun. Excepted.
Arriving at Chenoa 3:30 P. M., El Paso 4:08 P. M., Peoria 5:43 P. M., Canton 7:15 P. M., Bushnell 8:57 P. M., Keokuk 11:15 P. M., Warsaw 11:40 A. M.

Elegant Drawing Room Sleeping Cars

ATTACHED TO ALL NIGHT TRAINS.

Spacious and Fine Saloon Cars!

WITH ALL MODERN IMPROVEMENTS, RUN UPON ALL TRAINS.

BAGGAGE CHECKED THROUGH TO ALL IMPORTANT POINTS.

For Through Tickets, Sleeping Car Berths, Baggage Checks, and information, apply at the office of the Company in the Great Central Depot, foot of Lake St.

Hyde Park and Oakwoods Train.

HYDE PARK TRAIN...	LEAVE	*6:30 A. M.	ARRIVE	*7:45 A. M.	HYDE PARK TRAIN...	LEAVE	*8:00 P. M.	ARRIVE	*8:15 P. M.
HYDE PARK TRAIN...		*8:00 A. M.		*9:30 A. M.	HYDE PARK TRAIN...		*6:10 P. M.		*7:25 P. M.
HYDE PARK TRAIN...		*12:10 P. M.		*1:45 P. M.					

* Sundays Excepted.

W. P. JOHNSON, Gen. Pass. Agent.

M. HUGHITT, Gen. Supt.

CHICAGO & NORTHWESTERN R. W.

Comprising the PRINCIPAL RAILROADS from CHICAGO Directly NORTH NORTH-WEST and WEST.

ALL RAIL TO THE PACIFIC OCEAN!

Great California Line.

TRAINS LEAVE WELLS STREET DEPOT AS FOLLOWS:

8:30 A. M. Clinton Passenger.	10:00 P. M. Night Mail.
10:45 A. M. Pacific Express.	10:00 P. M. Rock Island Pass.
10:45 A. M. Rock Island Exp.	4:00 P. M. Dixon Passenger.

For Sterling, Rock Island, Fulton, Clinton, Cedar Rapids, Boone, Denison, Missouri Valley Junction, Sioux City, Council Bluffs and Omaha, there connecting with the

UNION PACIFIC R. R.

For Cheyenne, Denver, Ogden, Salt Lake, the White Pine Silver Mines, Sacramento, San Francisco, and all parts of Nebraska, Colorado, New Mexico, Arizona, Wyoming, Montana, Idaho, Utah, Nevada, and the PACIFIC COAST.

FROM CHICAGO	Hours	1st Class Fare	FROM CHICAGO	Days	1st Class Fare
To OMAHA.....	23	\$20.00	To SACRAMENTO..	4 1/2	\$118.00
" DENVER.....	52	65.00	" SAN FRANCISCO, 5		118.00

TRAINS ARRIVE:—Night Mail, 7:15 a. m.; Dixon Passenger, 11:10 a. m.; Pacific Express 4:15 p. m.; Rock Island Express, 4:15 p. m.; Clinton Passenger, 6:45 p. m.

FREEPORT LINE.

9:00 A. M. & 9:00 P. M. For Belvidere, Rockford, Freeport, Galena, Dunleith, and St. Paul.

4:00 P. M., Rockford Accommodation.
5:30 P. M., Geneva and Elgin Accommodation
6:10 P. M., Lombard Accommodation.
5:50 P. M., Junction Passenger.

TRAINS ARRIVE:—Freeport Passenger, 2:30 p. m.; 6:40 a. m.; Rockford Accommodation, 11:10 a. m.; Geneva and Elgin Accommodation, 8:45 a. m.; Junction Passenger, 8:10 a. m.; Lombard Accommodation, 6:50 a. m.

WISCONSIN DIVISION.

Trains leave Depot, cor. West Water and Kinzie Sts., daily, Sundays excepted, as follows:
10:00 A. M. DAY EXPRESS, for Janesville, Monroe, Whitewater, Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Neenah, Appleton, and Green Bay.

3:00 P. M., Janesville Accommodation.
5:00 P. M. NIGHT EXPRESS, for Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Neenah, Appleton, Green Bay, and THE LAKE SUPERIOR COUNTRY.

5:30 P. M., Woodstock Accommodation.
TRAINS ARRIVE:—7:00 a. m., 7:15 p. m., 9:00 a. m., and 2:05 p. m.

MILWAUKEE DIVISION.

MILWAUKEE MAIL.....	8:15 A. M.
EXPRESS, (ex. Sun.) Waukegan, Kenosha, Racine and Milwaukee.....	9:45 A. M.
EVANSTON ACCOMMODATION.....	1:00 P. M.
HIGHLAND PARK PASSENGER.....	6:20 P. M.
MILWAUKEE ACCOMMODATION, with Sleeping Car attached.....	11:00 P. M.
KENOSHA ACCOMMODATION, (Sundays excepted) from Wells St. Depot.....	4:10 P. M.
AFTERNOON PASSENGER.....	5:00 P. M.
WAUKEGAN ACCOMMODATION, (except Sundays) from Wells St. Depot.....	5:30 P. M.

TRAINS ARRIVE:—Night Accommodation, with Sleeping Car, 5:00 a. m.; Day Express, 4:15 p. m.; Milwaukee Mail, 10:30 a. m.; Afternoon Passenger, 7:40 p. m.; Waukegan Accommodation, 8:25 a. m.; Kenosha Accommodation, 9:10 a. m.; Evanston Accommodation, 3:30 p. m.; Highland Park Passenger, 7:55 p. m.

PULLMAN PALACE CARS ON ALL NIGHT TRAINS.

THROUGH TICKETS Can be purchased at all principal Railroad Offices East and South, and in Chicago at the Southeast corner of Lake and Clark Streets, and at the Passenger Stations as above.

H. P. STANWOOD,
Gen. Ticket Agt.

JOHN C. GAULT,
Gen'l Supt.

Milwaukee & St. Paul R. W.

THE ONLY ALL RAIL LINE TO

ST. PAUL AND MINNEAPOLIS!

AND ALL PORTIONS OF

Wisconsin, Minnesota & Northern Iowa.

PURCHASE TICKETS VIA MILWAUKEE.

Passengers Going via Milwaukee,

Have Choice of Seats in Clean Coaches, and on Night Trains, a full night's rest in Palace Sleeping Cars.

BAGGAGE CHECKED THROUGH BY THIS ROUTE ONLY!

PASSENGERS FROM CHICAGO can obtain these Advantages only by the MILWAUKEE DIVISION of the CHICAGO & NORTHWESTERN R. Y.

SPECIAL NOTICE.—Passengers destined to any place in Wisconsin, Minnesota, or Northern Iowa, either on or off the Lines of this Company, who cannot procure Through Tickets to their destination, should purchase their Tickets TO MILWAUKEE, as this is the Great Distributing Point for these States.

A. V. H. CARPENTER,
Gen. Pass. Agt. Milwaukee.

S. S. MERRILL,
Gen. Manager, Milwaukee.

LAKE SHORE — AND — MICHIGAN SOUTHERN R.W.

THE GREAT THROUGH LINE BETWEEN
CHICAGO, BUFFALO & NEW YORK,
WITHOUT CHANGE!

AND THE ONLY RAILWAY

RUNNING PALACE COACHES THROUGH!

— BETWEEN —

CHICAGO & NEW YORK, via BUFFALO

WITHOUT TRANSFER OF PASSENGERS!

All Trains Stop at Twenty-Second Street to Take and Leave Passengers.
Baggage Checked at that Station for all Points East.

4 EXPRESS TRAINS DAILY, [Sundays Excepted,] Leave
Chicago from the New Depot, on Van Buren St., at the head of La Salle Street, as follow

5:30 A. M. MAIL TRAIN.
VIA OLD ROAD AND AIR LINE. SUNDAYS EXCEPTED.

Leaves 22d Street 7:45 A. M. Stops at all Stations. Arrives—Cleveland, 9:35 P. M.

9:00 A. M. SPECIAL NEW YORK EXPRESS,
VIA AIR LINE. SUNDAYS EXCEPTED.

Leaves—Twenty-Second Street, 9:15 A. M. Arrives—Elkhart, 12:45 P. M.; Cleveland 9:45 P. M.; Buffalo, 4:10 A. M.; New York, 7:00 P. M.; (Chicago Time) Boston, 11:45 P. M.

This Train has PALACE SLEEPING COACH Attached, Running

THROUGH TO ROCHESTER, WITHOUT CHANGE!

IN DIRECT CONNECTION WITH

Wagner's Celebrated Drawing-Room Coaches on N. Y. Central R. R.

Only Thirty-Three Hours, Chicago to New York!

5:15 P. M. ATLANTIC EXPRESS (Daily),
VIA OLD ROAD.

Leaves—Twenty-Second Street 5:30 P. M. Arrives—Laporte, 8:10 P. M. (Stops 20 minutes or Supper); arrives at Toledo, 2:50 A. M.; Cleveland, 7:25 A. M. (30 minutes for Breakfast); arrives at Buffalo, 1:50 P. M.; Rochester, 5:10 P. M. (20 minutes for Supper); connects with Sleeping Coach running through from Rochester to Boston Without Change, making but One Change between Chicago and Boston.

NEW AND ELEGANT SLEEPING COACH Attached to this Train, Running THROUGH from CHICAGO TO NEW YORK WITHOUT CHANGE! Arrives at NEW YORK, 7:15 A. M.

9:00 P. M. NIGHT EXPRESS
VIA AIR LINE. (DAILY EXCEPT SAT. & SUN.)

Leaves—Twenty-Second Street, 9:15 P. M. Arrives—Toledo, 6:15 A. M. (30 minutes for Breakfast); arrives at Cleveland, 10:50 A. M.; Buffalo, 5:50 P. M.; New York, 12:00 M.; Boston, 3:50 P. M.

KALAMAZOO DIVISION.

Leave Chicago 9:00 A. M. Arrive at Kalamazoo 4:10 P. M.; Grand Rapids, 7:10 P. M.

Leave Chicago 9:00 P. M. Arrive at Kalamazoo 7:25 A. M.; Grand Rapids, 10:15 A. M.

There being no heavy grades to overcome, or mountains to cross, the road bed and track being the smoothest and most perfect of any railway in the United States, this Company run their trains at a high rate of speed with perfect safety.

Travelers who wish to SAVE TIME and make SURE CONNECTIONS, purchase Tickets via

LAKE SHORE & MICHIGAN SOUTHERN R'Y.

THE ONLY LINE RUNNING THROUGH BETWEEN CHICAGO AND BUFFALO, WITHOUT TRANSFER, and in Direct Connection with NEW YORK CENTRAL RAILROAD and ERIE RAILWAY.

General Ticket Office for Chicago, No. 56 Clark Street.

CHAS. F. HATCH,
General Superintendent, CLEVELAND, OHIO

F. E. MORSE,
General Western Passenger Agent, CHICAGO.

GREAT CENTRAL ROUTE!

SPEED! COMFORT! SAFETY!

MICHIGAN CENTRAL

— AND —

Great Western Railways.

THE FAVORITE ROUTE, VIA NIAGARA FALLS, TO

NEW YORK, BOSTON,
AND ALL EASTERN POINTS.

Pullman's Drawing-Room Cars

FROM CHICAGO TO NEW YORK WITHOUT CHANGE.

CELEBRATED HOTEL CARS FROM CHICAGO TO ROCHESTER.

Passenger Trains leave Chicago from Depot, foot of Lake Street, as follows: (All Trains Stop at Twenty-Second Street Station to receive and leave Passengers.)

5:40 A. M. MAIL TRAIN, Sundays Excepted.
Has a car attached from Chicago going over both Main Line and Air Line Division, Without Change. Connects at New Buffalo for St. Joseph; at Kalamazoo for Grand Rapids, Muskegon and Whitehall; at Jackson for Lansing, Saginaw and Bay City.

9:00 A. M. NEW YORK EXPRESS.
(SUNDAYS EXCEPTED.) Arrives at Michigan City at 11:10 A. M.; Niles, 12:20 P. M. [Dinner]; Kalamazoo, 2:10 P. M.; Marshall, 3:24 P. M.; Jackson, 4:30 P. M.; Detroit, 6:55 P. M. [Supper]; London, 11:25 A. M.; Hamilton, 2:35 A. M.; Niagara Falls, 4: A. M.; Rochester, 7:10 A. M. [Breakfast]; Albany, 2:00 P. M.; NEW YORK, 7:00 P. M.; Springfield, 7:40 P. M.; BOSTON, 11:45 P. M. This Train connects at ROCHESTER with

WAGNER'S DRAWING-ROOM CAR THROUGH

To New York City Without Change!

9:30 A. M. CINCINNATI & LOUISVILLE EXPRESS
(SUNDAYS EXCEPTED.) Through Cars to Indianapolis and Cincinnati without Change.

4:10 P. M. Kalamazoo, St. Joseph and Three Rivers Accom.
(SUNDAYS EXCEPTED.) Arrives at New Buffalo at 7:05 P. M.; St. Joseph, 8:40 P. M.; Kalamazoo, 10:05 P. M.; Three Rivers, 10:00 P. M.

5:15 P. M. ATLANTIC EXPRESS.
Leaves Daily. Arrives at Michigan City at 7:18 P. M.; Niles, 8:30 P. M. [Supper]; Kalamazoo, 10:40 P. M.; Jackson, 1:10 A. M.; Detroit, 3:45 A. M.; London, 8:55 A. M. [Breakfast]; Hamilton, 11:40 A. M.; Niagara Falls, 1:30 P. M.; Buffalo, 3:20 P. M.; Rochester, 5:10 P. M.; Albany, 1:30 A. M.; NEW YORK, 6:40 A. M.; Springfield, 6:40 A. M.; BOSTON 11:00 A. M. A MAGNIFICENT

PULLMAN DRAWING-ROOM SLEEPING CAR

IS ATTACHED TO THIS TRAIN DAILY, FROM

CHICAGO TO NEW YORK CITY.

The Celebrated HOTEL CAR is also Attached to this Train from CHICAGO TO ROCHESTER.

SPECIAL NOTICE.—Boston and New England Passengers will please notice that this Train now makes a direct connection through. A Sleeping Car is attached at Rochester at 5:30 P. M., running through to Springfield, Mass., thus avoiding transfer at Albany. Breakfast at Springfield. This Train reaches Springfield early enough second morning to CONNECT WITH ALL TRAINS up and down the Connecticut.

6:05 P. M. CINCINNATI & LOUISVILLE EXPRESS
(SATURDAYS EXCEPTED.) Through Sleeping Cars to Louisville without Change.

This is the Only Line Running Sleeping Cars to Louisville!

9:00 P. M. NIGHT EXPRESS. Saturdays and Sundays Excepted.
Arrives at Michigan City at 11:03 P. M.; Niles, 12:25 A. M.; Kalamazoo, 2:00; Marshall, 3:13; Jackson, 4:25; Grand Trunk Junction, 7:00; Detroit, 7:45; London, 1:45 P. M.; Hamilton, 4:25; Toronto, 9:35; Niagara Falls, 5:40; Buffalo, 7:15 P. M.; Rochester, 9:10; Syracuse, 12:25 A. M.; Rome, 1:55; Utica, 2:25; Albany, 6:50 A. M.; NEW YORK, 12:00 M.; BOSTON, 3:30 P. M.

A PULLMAN PALACE SLEEPING CAR

Is attached to this Train for DETROIT. This Train connects at DETROIT JUNCTION with Grand Trunk Railway for

MONTREAL, OGDENSBURG, &c.

9:00 P. M. Grand Rapids Express.
(SATURDAYS AND SUNDAYS EXCEPTED.) Arrives at Grand Rapids at 9:50 A. M.

An Elegant Pullman Sleeping Car

IS ATTACHED TO THIS TRAIN

THROUGH TO GRAND RAPIDS WITHOUT CHANGE!

Connecting there Direct to MUSKEGON, WHITEHALL, &c., &c.,

SPECIAL NOTICE.—The GREAT WESTERN RAILWAY of Canada have, during the past summer, put down 140 miles of New Rail, (a large proportion of the same being Steel Rails), and otherwise improved their track, so that it can be truly said that it is in as good condition as any Line in the country.

Through Tickets (and secured accommodations in Drawing-Room Sleeping Cars) can be purchased in Chicago at 60 Clark street (under Sherman House); at 48 Clark street (Grand Trunk Railway); at 53 Clark street (N. Y. C. R. R.); at office under Briggs House; at Great Central Depot, and at

General Office in Tremont House Block.

H. E. SARGENT,
Gen. Sup't M. C. R. R.

W. K. MUIR,
Gen. Sup't Gt. W. Ry.

HENRY C. WENTWORTH,
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